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11 CADD Notes

11.1 General

11.1.1 Sheet name conventions

To be consistent with the information being provided to all consultants under contract with the office the following CADD naming conventions shall be used for all projects.

A project file will contain all models necessary to provide the CADD details for the project. The normal CADD file naming convention is to use two digits for the county number, three digits for the route number and three digits for the paren number. The CADD file extension shall be “str” for preliminary design and “brg” for final design. An example is 42520006.str or 42520006.brg.

Model names for each plan sheet are named CountyDesignNumberSheetDesignation (i.e. 420399s000). Always use four digits for the design number using a preceding zero when necessary.

Types of sheet designations are as indicated in Table 11.1.1.

Table 11.1.1. Types of sheet designations

Description	Sheet Designation	Example
Project Border Information	bdr	420399bdr
Title Sheet	s000	420399s000
Revision Sheet	s000r	420399s000r
General Notes and Estimate	s001	420399s001
Plan and Profile Sheet(s)	s00?p(1)	420399s002p
Detail Sheets	s00?-s0??(1)	420399s003-420399s099

Table note:

(1) ? is the next number in the set of plan sheets.

The title sheet model will have the same CADD model name as the design sheets with an “s000” model designation at the end of the model name. On multiple design projects the title sheet model will use the lowest numeric design number in the CADD model.

For revised sheets requiring a new sheet to replace the original plan sheet, use the same model name with an “a” appended to the model name (i.e. 420399s005a). New replacement sheets will retain the same design sheet number and sheet number because this is a replacement sheet.

For revised sheets requiring a new additional sheet added to the plan, an “a” will be added to the design sheet number and sheet number. If the new additional plan sheet or sheets need to be located in the set of plans at a specific location, use the previous sheet’s model name adding an “a”. If the new additional plan sheet or sheets is following a new replacement sheet, use the previous sheet’s model name adding an “a1”. This will locate the design sheets in the correct order. The total design sheet number does not change and is not modified on the title sheet.

The model name for a revision sheet is the same model name as the title sheet with an “r” added (i.e. 420399s000r). This sheet will follow the title sheet model and be in the correct order for printing with this model name.

The plan and profile model for final design shall use a CADD model designation of “s002p”. If two plan and profile CADD sheets are used, the second sheet shall have a CADD model designation of “s003p”.

The detail sheets start with the number immediately following the last plan and profile sheet. Typically s003 would be the first detail sheet when only one sheet is needed to show the plan view.

When revised plan sheets are added to a project, the CADD model designation for the revised sheet shall be the same as the CADD model designation of the design sheet preceding the revised sheet in the plan with the following modifications. An “a” needs to be added to the CADD model designation for the revised sheet (example “s012a”). The design sheet number in the title block of the revised sheet shall also have an “a” added. An example of the design sheet number for the revised sheet shall be labeled “12a of 25” and placed after design sheet “12 of 25”. The total design sheet number does not change. The CADD model designation number and the design sheet number may or may not match. The sheet number shown in the lower right corner would need an “a” added to the revised sheets. The total sheet number shown on the title sheet for the total sheets does not change.

11.1.2 Note cell libraries

The office maintains MicroStation cell libraries for standard English and Metric notes. The cell libraries in design file format are available through the Iowa DOT web site at the following address:

www.iowadot.gov/bridge/v8tools.htm

The designer should use the standard notes where appropriate when developing bridge, culvert, and repair design plans. The designer should recognize, however, that the standard notes do not cover all possible conditions, and it will be necessary to add supplementary notes for each project.

The standard English and metric notes in the cell libraries also are listed in following articles in this manual. The manual notes may be searched with the Edit, Find tool available in Microsoft Word.

11.1.3 Note organization

Each of the articles that follows is in sequence based on note number range, and each article begins with an alphabetical topic index. Both English and metric notes are given if the note for a specific purpose includes measurable quantities; otherwise the identical English and metric notes are listed with a dual number. If a note has an A, B, or C suffix, the note is one of a series, and only one of the series should be used. In some cases there are instructions for use of the note, and those instructions follow the note. Table 11.1.3 gives an overview of the notes by article, general topic, typical sheet, and note number range.

Table 11.1.3. Overview of CADD notes

Article	General Topic: Typical Sheet	Note Number Range
11.2	Project: title sheet, general notes and quantities sheet, and situation plan sheet	1-99
11.3	New bridge: general notes and quantities sheet	100-299
11.4	Future notes	300-399 reserved
11.5	Bridge repair: general notes sheet, situation plan and quantities sheet, and specific detail sheets	400-499
11.6	Future notes	500-599 reserved
11.7	Culvert: general notes and quantities sheet	600-699
11.8	Bridge substructure: pier details sheets, and abutment details sheets	700-899
11.9	Bridge superstructure: superstructure details sheets	900-999
11.10	New and repair bridge detail: general notes sheet, and specific detail sheets	1000-1099
11.11	Estimate reference: general notes and quantities sheet	Reserved

11.1.4 Abbreviations

The following abbreviations are in standard notes and on standard sheets, and the designer may use the abbreviations on project plans.

ABUT. – ABUTMENT
ALT. – ALTERNATE
B.F. – BACK FACE
BARR. – BARRIER
BL (overlapped) – BASELINE

BOTT. – BOTTOM
BRG. – BEARING
CL. – CLEAR(ANCE)
CL (overlapped) – CENTERLINE
CONC. – CONCRETE
CONST. – CONSTRUCTION
CONT. -- CONTINUOUS
CTR. – CENTERS
DIA. – DIAMETER
DIAPH. – DIAPHRAGM
DNR – DEPARTMENT OF NATURAL RESOURCES
E. – EAST
EA. – EACH
E.B. – EASTBOUND
E.F. – EACH FACE
ELEV. – ELEVATION
EQ. – EQUAL
EXIST. – EXISTING
F.F. – FRONT FACE
FHWA – FEDERAL HIGHWAY ADMINISTRATION
F.L. – FLOWLINE
FTG. – FOOTING
GALV. – GALVANIZED
GR. – GRADE
H.M.A. – HOT MIX ASPHALT
HORIZ. – HORIZONTAL
H.P.C. – HIGH PERFORMANCE CONCRETE
H.W. – HIGH WATER
I-29, I-380, ETC. – INTERSTATE ROAD
IA5, IA92, ETC. – STATE ROAD
I.D.C. – IMPROVED DURABILITY CONCRETE
JT. – JOINT
K21, F63, ETC. – COUNTY ROAD
LONGIT. – LONGITUDINAL
LT. – LEFT
MAX. – MAXIMUM
MIN. – MINIMUM
M.S.E. – MECHANICALLY STABILIZED EARTH
N. – NORTH
N.B. – NORTHBOUND
P.C.C. – PORTLAND CEMENT CONCRETE
P.G.L. – PROFILE GRADE LINE
PROP. – PROPOSED
RAD. – RADIUS
R.C.B. – REINFORCED CONCRETE BOX
REINF. – REINFORCEMENT
RR – RAILROAD
RT. – RIGHT
S. – SOUTH
S.B. – SOUTHBOUND
SDWK. – SIDEWALK
SHLD. – SHOULDER
SHT. – SHEET
SPA. – SPACES
SPCG. – SPACING
ST. – STREET

STA. – STATION
STD. – STANDARD
STIFF. – STIFFENER
STRUCT. – STRUCTURE
SUPERELEV. – SUPERELEVATION
SYM. – SYMMETRICAL
TEMP. – TEMPORARY
TRANSV. – TRANSVERSE
TYP. – TYPICAL
U.A.C. – USE AS CONSTRUCTED
US20, US65, ETC. – FEDERAL HIGHWAY
VAR. – VARIES or VARIABLE
VERT. – VERTICAL
W. – WEST
W.B. – WESTBOUND
W.P. – WORKING POINT

11.1.5 References

American Association of State Highway and Transportation Officials (AASHTO). *Guide Design Specification for Bridge Temporary Works*. Washington: AASHTO, 1995. Note that this guide is based on the 5th edition of *Formwork for Concrete* and the 1991 edition of *National Design Specification for Wood Construction* and *Supplement.*

11.2 Project

These notes usually are placed on the title sheet, on the general notes and quantities sheet, and on the situation plan sheet.

11.2.1 Index

Abutment modification
- Integral, wing extensions E51/M51
- Stub E52/M52
- Stub abutment piling behind MSE walls E55/M55

Construction permit
- Sovereign lands E25/M25

Design stresses (See Specifications and design stresses below.)

Form removal
- Minimum concrete flexural strength E70

Pollution prevention plan
- See design sheet E40A/M40A
- Shown elsewhere in plans E40B/M40B

Project coordination
- More than one contractor in area E46/M46
- ~~One contractor in area only ..... E47/M47~~

Roadway quantities
- Shown elsewhere in plans E45/M45

Seals
- Index E20/M20

Specifications and design stresses
- LRFD superstructure and substructure bridge E50D
- LRFD superstructure and substructure bridge 2012 ..... E50E
- Nonstandard single and twin culvert E50B/M50B
- Standard bridge E50, M50

Standard and nonstandard triple culvert E50B
Subdrain
Slope rate E60, M60
Traffic control plan
Roadway closed, responsibility of road contractor E33/M33
Roadway closed, shown elsewhere E31B/M31B
Roadway closed, shown on road plan E30B/M30B
Roadway not open, relocation E34/M34
Roadway open, see design sheet E32/M32
Roadway open, shown elsewhere E31A/M31A
Roadway open, shown on road plan E30A/M30A
Working drawings
Checked by E15/M15

11.2.2 Listing

E15/M15: Working drawings, checked by

ALL WORKING DRAWINGS INCLUDING SHOP DRAWINGS AND FALSEWORK DRAWINGS WILL BE CHECKED BY:

FIRM NAME
FIRM ADDRESS

E20/M20: Seals, index

INDEX OF SEALS

SHEET NO. NAME

1
2
3
4
5

E25/M25: Construction permit, sovereign lands

SOVEREIGN LANDS CONSTRUCTION PERMIT ____ SHALL APPLY TO WORK ON THIS PROJECT. THE IOWA DNR CONSERVATION OFFICER FOR THE AREA SHALL BE CONTACTED. AT LEAST 48 HOURS PRIOR TO COMMENCING WORK CONTACT ____ AT ____.

Fill in the permit number, name of the local Iowa DNR conservation officer, and full telephone number of the officer. The officer's name and telephone number are available on the Sovereign Lands Construction Permit for the bridge project.

E30A/M30A: Traffic control plan, roadway open, shown on road plan

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN ON THE ROAD PLAN IN THESE PLANS.

E30B/M30B: Traffic control plan, roadway closed, shown on road plan

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN ON THE ROAD PLAN IN THESE PLANS.

E31A/M31A: Traffic control plan, roadway open, shown elsewhere

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

When traffic is maintained through the project we will continue to get traffic control notes and plans from the Office of Design for inclusion in our plans.

E31B/M31B: Traffic control plan, roadway closed, shown elsewhere

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

E32/M32: Traffic control plan, roadway open, see design sheet

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN ON DESIGN SHEET x.

When traffic is maintained through the project we will continue to get traffic control notes and plans from the Office of Design for inclusion in our plans.

E33/M33: Traffic control plan, roadway closed, responsibility of contractor

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. ROAD CLOSURE WILL BE THE RESPONSIBILITY OF THE ROAD CONTRACTOR AS SHOWN ON THE ROAD PLANS.

E34/M34: Traffic control plan, roadway not open, relocation

TRAFFIC CONTROL PLAN

NOTE: THIS STRUCTURE IS BEING CONSTRUCTED ON A RELOCATION AND THE ROAD WILL NOT BE OPEN TO TRAFFIC UNTIL AFTER COMPLETION OF CONSTRUCTION.

E40A/M40A: Pollution prevention plan, see design sheet

NOTE:
SEE DESIGN SHEET x FOR POLLUTION PREVENTION PLAN.

E40B/M40B: Pollution prevention plan, shown elsewhere in plans

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

E45/M45: Roadway quantities, shown elsewhere in plans

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

E46/M46: Project coordination, more than one contractor in area

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME

PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

This note is to be used where more than one contractor is in the area. Check with the supervising Section Leader about which other projects will be in progress while the bridge/culvert contractor is working.

Verify this information with the District Construction Engineer and/or Assistant District Engineer prior to hand in. Modify the note to indicate "Culvert Contractor" when project involves culvert construction.

~~**E47/M47: Project coordination, one contractor in area only**~~

~~THE BRIDGE CONTRACTOR WILL BE THE ONLY CONTRACTOR AT THE SITE AND IS RESPONSIBLE FOR THE COMPLETION OF ALL WORK AS DETAILED AND NOTED IN THESE PLANS.~~

~~This note is to be used only when this project involves a spot replacement and all roadwork and structure work is included in one project.~~

E50: Specifications and design stresses, standard bridge, English

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 2002.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

?

?

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002.

REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 3,500 PSI.

PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET ?.

STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W).

FATIGUE STRESS CYCLES BASED ON CASE ?.

These standard bridge design notes are to be used on the front estimate sheet.

M50: Specifications and design stresses, standard bridge, metric

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 2002.

ALLOWABLE STRESSES AND LOADING INFORMATION HAVE BEEN CONVERTED TO METRIC.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS
FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.
?
?

DESIGN STRESSES:
DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 400.
CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 24 MPa.
PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET ?.
STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10. ASTM A709 GRADE 250, GRADE 345, AND GRADE 345W (AASHTO M270 GRADE 250, GRADE 345, AND GRADE 345W).
FATIGUE STRESS CYCLES BASED ON CASE ?.

These standard bridge design notes are to be used on the front estimate sheet.

E50B: Specifications and design stresses, nonstandard single and twin culvert, standard and nonstandard triple culvert

SPECIFICATIONS:
DESIGN: AASHTO SERIES OF 1992.
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.
?
?

DESIGN STRESSES:
DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1992.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 3,500 PSI.

These culvert design notes are to be used on the front estimate sheet for new single and twin culverts (non-standard sizes and fills) and triple culverts (standard and non-standard sizes and fills).

E50E: Specifications and design stresses, LRFD superstructure and substructure bridge 2012

SPECIFICATIONS:
DESIGN: AASHTO LRFD 6th Ed, SERIES OF 2012, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS,

DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

?

?

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6th Ed, SERIES OF 2012, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4.0 KSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.

PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET?

BRIDGE DECK CONCRETE f'c =?

STRUCTURAL STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W).

This LRFD bridge design note is to be used on the front estimate sheet when the superstructure and substructure were designed by the AASHTO LRFD 6th Edition, Series 2012. Concrete design strength for Class C concrete has been raised to 4.0 ksi for bridges for which design was started during or after July 2011. Until the Standard Specifications are revised, also use CADD Note E70 to increase flexural strength for form removal to 575 psi.

E51/M51: Abutment modification, integral, wing extensions

THE CONTRACTOR SHALL NOTE THE STANDARD ABUTMENT DETAILS HAVE BEEN MODIFIED TO OFFSET THE ABUTMENT FOOTING FROM THE WINGWALL TO AID IN TYING THE REINFORCING STEEL BETWEEN THE FOOTING TO WINGWALL AND THE FOOTING TO BACKWALL.

This note is to be used with integral abutment C and D beam bridges with wing extensions.

E52/M52: Abutment modification, stub

THE CONTRACTOR SHALL NOTE THE STANDARD ABUTMENT DETAILS HAVE BEEN MODIFIED TO OFFSET THE ABUTMENT FOOTING FROM THE WINGWALL AND THE ABUTMENT FOOTING FROM THE BACKWALL TO AID IN TYING THE REINFORCING STEEL BETWEEN THE FOOTING TO WINGWALL AND THE FOOTING TO BACKWALL.

This note is to be used with stub abutment bridges.

E55/M55: Abutment modification, stub abutment piling behind MSE wall

THE BRIDGE CONTRACTOR SHALL DRIVE ABUTMENT PILING BEFORE THE MECHANICALLY STABILIZED EARTH (MSE) WALL IS CONSTRUCTED AND MAINTAIN PROPER POSITION OF PILING WHILE THE MSE WALL IS BEING CONSTRUCTED. THE PILING SHALL BE TIED TOGETHER BY MECHANICAL MEANS AND ANCHORED TO PREVENT DISPLACEMENT DURING BACKFILLING OPERATIONS AND MSE WALL CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A PLAN TO THE ENGINEER FOR APPROVAL OF THE CONNECTIONS AND ANCHORAGE.

This CADD general note shall be provided in the plans requiring the contractor to tie the abutment piling group together and provide anchorage for the pile group to prevent shifting of the piles during backfilling. This note may be modified for special cases, such as partial driving, addition of tie backs, or if additional rows of piles are required for the abutments.

E60: Subdrain, slope rate

NOTE: SUBDRAIN SLOPED x"
PER FOOT FROM _____
TO EXTEND THRU FILL (TYPICAL BOTH ABUTMENTS).

M60: Subdrain, slope rate

NOTE: SUBDRAIN SLOPED _____% FROM _____
TO EXTEND THRU FILL (TYPICAL BOTH ABUTMENTS).

E70: Form removal, minimum concrete flexural strength

CONCRETE FORMS ARE REQUIRED TO REMAIN IN PLACE 5 DAYS OR LONGER IN ACCORDANCE WITH ARTICLE 2403.03, M, 2, OF THE STANDARD SPECIFICATIONS, EXCEPT THE MINIMUM CONCRETE FLEXURAL STRENGTH REQUIRED BEFORE REMOVAL OF FORMS SHALL BE 575 PSI.

11.3 New bridge

These notes usually are placed on the general notes and quantities sheet.

11.3.1 Index

Approach fills
- Driving piles, waiting period E175/M175
- Not in contract, shape berms E183/M183

Bridge deck
- Dimension table E110, M110
- Two-course, surface preparation E234, M234

Concrete aggregate
- District 1 ..... E109/M109

Concrete barrier rails
- Slipform method, concrete class E188/M188

Concrete sealer
- Bridge seats E181/M181

Detour bridge
- Contractor notification E231/M231

Driven piles
- Service to LRFD comparison E177

Earth retention
- Behind abutments E170/M170
- Temporary shoring E171/M171
- Temporary shoring, PE required E172/M172

Excavation
- Channel by bridge contractor, dimensioned E140A, M140A
- Channel by bridge contractor, approximate limits E140B/M140B
- Channel by others E141/M141
- Channel not in contract, shape berms E142/M142
- Class 20 assumption E145/M145
- Roadway by others E143/M143
- Sites for excess material E144/M144

Existing structure
- Faint lines E102/M102
- Field verify dimensions E101/M101
- Repair, widening, etc. E100A/M100A
- Repair, widening, etc. structural steel E100B/M100B

Guardrail
- Placed by others E105/M105

Live load
- HL-93 bridge E104D
- HS20-44 (MS18) E104A, M104A
- HS20-44 (MS18) plus alternate military E104B, M104B

Longitudinal grooving
- Is in a tied project E206/M206
- Paving by others E205/M205

Metric project
- Dimensions M107

Nuclear density checks
- Deck test wells E233/M233

Paint
- Non-weathering steel, new bridge E214/M214
- Weathering steel, new bridge E213, M213

Pile points
- H-piles E187/M187

Precast concrete deck panels
- Option E200/M200

Prebored holes
- Integral abutment piles E184/M184

Pretensioned prestressed concrete beams
- Nonstandard E201/M201

Railroad overpass
- Coordination E108/M108

Reinforcing
- English, metric designation on plans E189, M189

Removal of existing structure
- Bridge E131/M131
- Feather edging E133/M133
- Miscellaneous E132/M132
- Partial E130/M130

Scrape test
- Lead and chromium ppm (in BDM 11.5.2) E480/M480

Traffic control
- Road closed E120/M120
- Road open E121/M121

Utility notification
- Rural E103A/M103A
- Urban E103B/M103B

Weathering steel
- Stain protection for substructure concrete E186/M186

Wing slopes
- Dress after bridge repair E185/M185

Note: Value engineering Note E106/M106 has been removed.

11.3.2 Listing

E100A/M100A: Existing structure, repair, widening, etc.

COPIES OF ORIGINAL DESIGN PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. _____).

Use this note on all repair work, widening or remodeling, culvert extensions, or retrofit rails.

E100B/M100B: Existing structure, repair, widening, etc., structural steel

COPIES OF THE ORIGINAL DESIGN PLANS AND SHOP DRAWINGS WILL BE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS HIGHWAY DIVISION - IOWA DOT - AMES. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. _____).

Use this note on all repair work and widening or remodeling involving existing structural steel.

E101/M101: Existing structure, field verify dimensions

ALL ALIGNMENT, STATIONING, CONNECTING DIMENSIONS, AND ELEVATIONS USED IN THE NEW DETAILS IN THESE PLANS WERE DEVELOPED BASED ON THE EXISTING BRIDGE PLANS. THE BRIDGE CONTRACTOR SHALL FIELD VERIFY THESE DETAILS BEFORE STARTING CONSTRUCTION.

This note shall be used on all widening projects and major repairs.

E102/M102: Existing structure, faint lines

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

E103A/M103A: Utility notification, rural

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

Use this note for bridge projects in rural areas.

E103B/M103B: Utility notification, urban

THE CITY AND UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

Use this note for bridge projects in urban areas.

E104A: Live load, HS20-44

THIS BRIDGE IS DESIGNED FOR HS20-44 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

Use this note for the design live load requirement for all new bridges on primary highways, excluding interstates. For interstate bridges use the note that includes alternate military load [E104B].

M104A: Live load, MS18

THIS BRIDGE IS DESIGNED FOR MS18 LOADING, PLUS 960 Pa FOR FUTURE WEARING SURFACE.

Use this note for the design live load requirement for all new bridges on primary highways, excluding interstates. For interstate bridges use the note that includes alternate military load [M104B].

E104B: Live load, HS20-44 plus alternate military

THIS BRIDGE IS DESIGNED FOR HS20-44 + ALTERNATE MILITARY LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

Use this note for the design live load requirement for all new bridges on interstates.

M104B: Live load, MS18 plus alternate military

THIS BRIDGE IS DESIGNED FOR MS18 + ALTERNATE MILITARY LOADING, PLUS 960 Pa FOR FUTURE WEARING SURFACE.

Use this note for the design live load requirement for all new bridges on interstates.

E104D: Live load, HL-93 bridge

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

Use this note for the design live load requirement for all new bridges on primary highways, where both the superstructure and substructure are designed using LRFD.

E105/M105: Guardrail, placed by others

GUARDRAIL IS TO BE PLACED BY OTHERS.

Verify whether guardrail work is a part of the bridge contract or another contract.

On jobs where road and bridge plans are combined do not reference work shown in the plans to be done "by others". On combined plans there are no "others".

M107: Metric project, dimensions

ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED OR SHOWN.

ALL ELEVATIONS ON THESE PLANS SHOWN IN METERS (m).

ALL STATIONS SHOWN IN METERS (m).

E108/M108: Railroad overpass, coordination

THE BRIDGE CONTRACTOR SHALL WORK IN SUCH A MANNER THAT EQUIPMENT AND MATERIALS SHALL NOT BE ALLOWED TO INTERFERE WITH TRAIN TRAFFIC OR BE ALLOWED TO FALL ON THE RAILROAD TRACKS. INTERFERENCE ABOVE THE RAILROAD TRACK AREA SHALL BE COORDINATED WITH THE RAILROAD.

E109/M109: Concrete aggregate, District 1

ALL COARSE AGGREGATE FOR STRUCTURAL CONCRETE SHALL BE CRUSHED LIMESTONE.

Place this in the general notes for bridge projects located in District 1.

E110: Bridge deck, dimension table

BRIDGE DECK DIMENSIONS TABLE

ITEM		UNITS	QUANTITY
1	DECK LENGTH	L.F.	
2	MINIMUM DECK WIDTH	L.F.	
3	MAXIMUM DECK WIDTH	L.F.	
4	DECK AREA	S.F.	

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.
2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.
4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

Lengths should be to the nearest 0.1 of a foot, and areas should be to the nearest 1 ft^2. E110 is only necessary on new and replacement bridges.

M110: Bridge deck, dimension table

BRIDGE DECK DIMENSIONS TABLE			
ITEM		UNITS	QUANTITY
1	DECK LENGTH	M	
2	MINIMUM DECK WIDTH	M	
3	MAXIMUM DECK WIDTH	M	
4	DECK AREA	M^2	

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.
2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.
4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

Lengths should be to the nearest 0.01m, and areas should be to the nearest 0.1m^2. M110 is only necessary on new and replacement bridges.

E120/M120: Traffic control, road closed

THE ROAD WILL BE CLOSED TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE ON DESIGN SHEET x.

Always relate traffic notes to the traffic control plan note.

E121/M121: Traffic control, road open

THE ROAD WILL BE OPEN TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE ON DESIGN SHEET x.

Always relate traffic notes to the traffic control plan note.

E130/M130: Removal of existing structure, partial

"REMOVALS AS PER PLAN" INCLUDE ALL COSTS ASSOCIATED WITH REMOVING THE_____.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO OTHER PORTIONS OF THE EXISTING STRUCTURE NOT NOTED FOR REMOVAL SHALL BE THE RESPONSIBILITY OF THE BRIDGE CONTRACTOR AND SHALL BE REPAIRED AT NO EXTRA COST TO THE STATE.

Use this note where partial removal of a structure is required. Refer to the instructions for E131 for comments concerning salvage of material. Include scrape test note if painted steel items are involved in the removal.

E131/M131: Removal of existing structure, bridge

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING (describe) DESIGN NO. _____. PLANS OF THE EXISTING BRIDGE WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE (describe bridge & any special removal limits).

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS.

This note is to be used on bridge replacement projects. Describe the existing structure and any removal limits that are different from what is specified in the Standard Specifications. Include scrape test note if painted steel items are involved in the removal.

When structural steel is to be removed as part of a federal aid project (this includes removal of the complete bridge or a portion of the bridge such as a bridge rail) normally the steel is given to the contractor [IDOT SS 2401.01]. In this case, FHWA will participate in the cost of the removal.

Occasionally the steel removed will be retained by the state or given to the county. The Standard Specifications state the contractor is required to stockpile this material at the site [IDOT SS 2401.03, E]. In this case the FHWA will participate in the cost of removal. The stockpiling at the site will be included in the removal item. The plan shall indicate which steel is to remain property of the contracting authority. In the event the county would like the contractor to assist them in loading the material onto county vehicles or hauling the material to another site for storage, they are expected to negotiate these items separately with the contractor. These items shall not be mentioned on the plan. If the state would like the contractor to assist them in loading the material onto state vehicles or hauling the material to another site for storage, the items should be bid separately (hauling and storing structural steel). This item will be considered as non-participating and so noted in the estimate reference information on the plans.

The FHWA requires the salvaged material removed using a federal participation removal item must be reused on projects eligible for federal aid funds. We will assume this will be the case unless we have knowledge to the contrary. If the salvage material will not be reused on a project eligible for federal aid, the FHWA will be reimbursed for the salvage value of the material.

The Office of Contracts now includes notes in the proposal to cover the notification process for bridge removals. Therefore, previously released notes regarding notification will no longer be required in the bridge plans and have been deleted from the CADD cell library and this listing of CADD notes.

E132/M132: Removal of existing structure, miscellaneous

THE BID ITEM "REMOVALS AS PER PLAN" SHALL INCLUDE ALL COSTS ASSOCIATED WITH REMOVING THE _____. REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS.

Use this note when the removals involve miscellaneous items (retaining walls, pipes, etc.)

E133/M133: Removal of existing structure, feather edging

THE BRIDGE CONTRACTOR IS TO PROVIDE A METHOD OF REMOVAL THAT WILL PREVENT FEATHER EDGING AT THE BOTTOM OF THE EXISTING SLAB. CARE SHALL BE TAKEN WHEN EXPOSING EXISTING REINFORCING SO THE BOND TO EXISTING CONCRETE IS NOT BROKEN AT THE CONCRETE BREAK LINES.

Use this note for bridge widening, beam replacements, or other projects where a portion of the slab is to be removed.

E140A: Excavation, channel by bridge contractor, dimensioned

THE BRIDGE CONTRACTOR IS TO CLEAR THE CHANNEL UNDER THE BRIDGE FOR A DISTANCE OF x FEET ON EITHER SIDE OF THE CENTERLINE OF ROADWAY AS SHOWN BY THE HATCHED AREAS ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET x.

Channel excavation may be done by the bridge or road contractor. In most instances the bridge plan will indicate the bridge contractor will clear the channel for a distance of 10 feet outside the limits of the bridge upstream and downstream with the additional work being done by the road contractor. This could be modified based on the removal responsibility of the existing bridge or the extent of other work in the area. Coordinate this with the Office of Design.

If road and bridge work are combined in a single contract, all channel excavation should be included with road quantities.

M140A: Excavation, channel by bridge contractor, dimensioned

THE BRIDGE CONTRACTOR IS TO CLEAR THE CHANNEL UNDER THE BRIDGE FOR A DISTANCE OF x mm ON EITHER SIDE OF THE CENTERLINE OF ROADWAY AS SHOWN BY THE HATCHED AREAS ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET x.

Channel excavation may be done by the bridge or road contractor. In most instances the bridge plan will indicate the bridge contractor will clear the channel for a distance of 3050 mm outside the limits of the bridge upstream and downstream with the additional work being done by the road contractor. This could be modified based on the removal responsibility of the existing bridge or the extent of other work in the area. Coordinate this with the Office of Design.

If road and bridge work are combined in a single contract, all channel excavation should be included with road quantities.

E140B/M140B: Excavation, channel by bridge contractor, approximate limits

THE BRIDGE CONTRACTOR IS TO CLEAR AND/OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS OF THE HATCHED AREAS AS SHOWN ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET x.

This note is to be used when bridge contractor does Class 10 Channel to limits other than 10feet outside the bridge deck. Show limits on the plan details.

E141/M141: Excavation, channel by others

WHEN CHANNEL EXCAVATION IS DONE BY OTHERS, THE "CLASS 10 CHANNEL EXCAVATION" BID ITEM WILL BE DELETED FROM THE BRIDGE CONTRACT. NO PAYMENT WILL BE MADE FOR WORK DELETED.

On jobs where road and bridge plans are combined, do not reference work shown in the plans to be done "by others". On combined plans there are no "others".

Many stream crossing bridge plans indicate that the bridge contractor is to clean the channel under the bridge. There is a pay item on the bridge plans for Class 10 channel excavation for that amount of earth to be removed from the stream channel under the bridge. Normally the road plans for the project will also have an item for Class 10 channel excavation which includes that amount to be excavated under the bridge.

This has caused problems on several projects in the past. Normally the grading contractor will do all of the Class 10 channel excavation. This requires deletion of that item from the bridge contract. Some bridge contractors have then asked for partial payment for the item of channel excavation even though they have not been required to do the work. They claim that a portion of their fixed overhead cost was included in this item and deletion of the item denies them recovery of that fixed cost.

Placing this note on the plans could eliminate this problem.

Add this note to the plans when the channel excavation is also included on the road plans.

E142/M142: Excavation, channel not in contract, shape berms

THE CHANNEL EXCAVATION AS SHOWN IS NOT A PART OF THIS CONTRACT, BUT SHALL BE COMPLETED BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

Use this note when the Office of Design has agreed to place channel excavation on road plans.

Bridge plans generally include a note requiring the contractor to "level off and shape the berms to the elevations and dimensions shown." On large fills, the bridge contractor is often required to do extensive shaping and dressing of the slopes because the grading contractor did not properly shape them. To fix the responsibility for the various items of work upon the proper contractor, please use this note.

Include the amended note on consultant plans.

E143/M143: Excavation, roadway by others

ROADWAY EXCAVATION IS TO BE DONE BY OTHERS AND IS NOT A PART OF THIS CONTRACT. EXCAVATION QUANTITIES FOR THE PIERS ARE BASED ON THE ASSUMPTION THAT ROADWAY EXCAVATION WILL HAVE BEEN COMPLETED AND ABUTMENT FILLS ARE IN PLACE PRIOR TO STARTING CONSTRUCTION OF THE PIERS.

Use this note for an overhead structure when roadway excavation is required to establish a grade or ditches on the road below. Coordinate with the Office of Design.

On jobs where road and bridge plans are combined, do not reference work shown in the plans to be done "by others". On combined plans there are no "others".

E144/M144: Excavation, sites for excess material

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

Use this note on all plans that have excavation (Class 10 Channel, Class 20, 21, and 22) unless we provide an overhaul bid item.

If a significant amount of excess excavated material is involved and a separate road contractor is at the site, this material may need to be stockpiled. Check with the Office of Design.

E145/M145: Excavation, Class 20 assumption

CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE CHANNEL EXCAVATION IS COMPLETED PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS AND PIERS.

Do not use this note if channel excavation is part of the bridge plan. Assume the contractor will be paid for Class 10 down to noted elevation and Class 20 below noted elevation. See the Standard Specifications [IDOT SS 2402.04, A]. If channel excavation is by others, include this note. This assumes Class 10 has been completed prior to this contract. If not the contractor will be paid for additional Class 20 excavation.

E170/M170: Earth retention, behind abutments

THE BRIDGE CONTRACTOR IS TO RETAIN EARTH AND/OR GRANULAR MATERIAL BEHIND THE PORTION OF ABUTMENTS SUBJECTED TO TRAFFIC DURING WIDENING BY METHODS APPROVED BY THE ENGINEER. ALL COSTS FOR RETAINING THE EARTH AND/OR GRANULAR MATERIAL SHALL BE INCLUDED IN THE PRICE BID FOR "CLASS 20 EXCAVATION".

Use this note for widening projects or stage construction projects when appropriate.

E171/M171: Earth retention, temporary shoring

THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING (SHEET PILE OR OTHER) TO PREVENT THE EARTH UNDER THE TRAFFIC LANE, FROM SLOUGHING IN DURING CONSTRUCTION. ALL COST OF SHORING, WILL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO DIRECT PAYMENT WILL BE MADE. ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. SHORING IS TO BE REMOVED ONLY AFTER BACKFILLING HAS BEEN COMPLETED. THE CONTRACTOR SHALL SUBMIT SHORING PLANS FOR REVIEW. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07 OF THE STANDARD SPECIFICATIONS STILL APPLIES.

Use this note when excavation in Zone 2 is required. (See the commentary for information on Zone 2.)

Staged construction may require excavation very close to a traffic lane and temporary embankment support (shoring) may be necessary to safely maintain traffic. The plans shall require the Contractor to provide adequate shoring and the details shall be reviewed and approved by the Engineer.

This note will need to be modified to accommodate specific job situations such as type of structure, embankment location, etc.

For situations where traffic is shifted to the shoulders, consideration should be given to shoring or slope stability. The temporary slope of 1.5:1 for Zone 1 is limited to fill heights of less than 20 ft. (6 m) unless a global stability analysis is performed.

E172/M172: Earth retention, temporary shoring, PE required

TEMPORARY SHORING (SHEET PILE OR OTHER) SHALL BE REQUIRED AS NECESSARY TO PREVENT THE EARTH UNDER THE TRAFFIC LANE FROM SLOUGHING IN DURING CONSTRUCTION.

THE CONTRACTOR SHALL SUBMIT A TEMPORARY SHORING PLAN TO THE ENGINEER FOR APPROVAL. THE TEMPORARY SHORING PLAN SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA. THE CONTRACTOR SHALL SUBMIT 6 COPIES OF PLANS FOR TEMPORARY SHORING. THE ENGINEER WILL BE ALLOWED 30 CALENDAR DAYS TO REVIEW THE TEMPORARY SHORING PLAN. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE TEMPORARY SHORING WITHOUT NOTICE TO PROCEED FROM THE ENGINEER.

THE TEMPORARY SHORING SUBMITTAL SHALL INCLUDE:

- DESIGN CALCULATIONS (INCLUDING A GLOBAL STABILITY ANALYSIS)
- SOIL PROPERTIES
- SHORING MATERIAL PROPERTIES
- SHORING PLAN LAYOUT (SHOWING LOCATION OF TRAFFIC)
- SHORING DETAILS

TEMPORARY SHORING SHALL BE PAID FOR AS A LUMP SUM INCLUDING ALL COST FOR DESIGNING, FURNISHING, INSTALLING AND REMOVAL. ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. SHORING IS TO BE REMOVED ONLY AFTER BACKFILLING HAS BEEN COMPLETED. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07 OF THE STANDARD SPECIFICATIONS STILL APPLIES.

Use this note when excavation is in Zone 3. (See the commentary for information on Zone 3.) Also, use the appropriate lump sum bid item for temporary shoring along with note E172.

2501-8400172	Temporary Shoring	LS	(English)
2501--321011	Temporary Shoring	LS	(Metric)

The contractor will be paid a lump sum contract price for temporary shoring. This payment shall be full compensation for all costs associated with designing, furnishing, installing and removing the temporary shoring.

Design and review of the temporary shoring is to be based on *AASHTO Guide Design Specification for Bridge Temporary Works* [BDM 11.1.5].

E175/M175: Approach fills, driving piles, waiting period

ABUTMENT PILES SHALL NOT BE DRIVEN FOR A MINIMUM OF ?? DAYS FOLLOWING COMPLETION OF APPROACH FILLS. THE TIME PERIOD BETWEEN COMPLETION OF FILLS AND DRIVING PILES MAY BE CHANGED AS ORDERED BY THE ENGINEER BASED UPON REVIEW OF SETTLEMENT PLATES.

This note shall be used in situations where new berms are being constructed and settlement is an issue. The number of days used in the note will be based on recommendations from the Soils Section of the Office of Design. Typical delay periods range from 90 to 180 days; however, longer or shorter periods are possible.

E177: Driven piles, service to LRFD comparison

THIS PROJECT USES THE LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHODOLOGY FOR DETERMINING PILE CONTRACT LENGTH AND NOMINAL AXIAL BEARING RESISTANCE. NOMINAL AXIAL BEARING RESISTANCES WILL BE LARGER THAN

BEARING VALUES IN THE PAST, BUT CONSTRUCTION CONTROL BLOW COUNTS WILL BE APPROXIMATELY THE SAME. ___ THAT GIVES THE RELATIONSHIP BETWEEN REQUIRED NOMINAL AXIAL BEARING RESISTANCE AND BLOW COUNT.

FOR THE CONTRACTOR'S BIDDING PURPOSES, PARTICULARLY FOR THE SIZING OF THE PILE DRIVING HAMMER, THE APPROXIMATE PREVIOUS DESIGN METHODOLOGY BEARING VALUES AT END OF DRIVE (EOD) ARE GIVEN BELOW. THESE VALUES SHALL NOT BE USED FOR CONSTRUCTION CONTROL AND ARE GIVEN ONLY FOR COMPARATIVE PURPOSES.

- THE PREVIOUS DESIGN BEARING FOR THE ___ ABUTMENT PILES WOULD HAVE BEEN ABOUT ___ TONS.
- THE PREVIOUS DESIGN BEARING FOR THE PIER ___ PILES WOULD HAVE BEEN ABOUT ___ TONS.
- THE PREVIOUS DESIGN BEARING FOR THE PIER ___ PILES WOULD HAVE BEEN ABOUT ___ TONS.
- THE PREVIOUS DESIGN BEARING FOR THE ___ ABUTMENT PILES WOULD HAVE BEEN ABOUT ___ TONS.

This note shall be added to the general notes for all projects that use the new ISU-calibrated LRFD pile methodology.

(1) In the first paragraph fill in the blank for the office, agency, or consultant that will be preparing the construction control documents or substitute for the sentence.
   - For typical state projects fill in the blank with the following: A WEAP ANALYSIS AND BEARING GRAPH WILL BE PREPARED BY THE OFFICE OF CONSTRUCTION.
   - For projects with Iowa DOT ENR Formula control fill in the blank with the following: ___ WILL MANAGE CONSTRUCTION CONTROL WITH THE IOWA DOT ENR FORMULA and fill in the local agency or consultant.
   - For projects that use PDA/CAPWAP substitute the following for the entire sentence: A WEAP ANALYSIS AND BEARING GRAPH WILL BE PREPARED BY THE OFFICE OF CONSTRUCTION THAT GIVES THE RELATIONSHIP BETWEEN REQUIRED NOMINAL AXIAL BEARING RESISTANCE AND BLOW COUNT. PDA AND CAPWAP ANALYSIS ALSO WILL BE MANAGED BY THE ___. Fill in the blank with either CONTRACTOR or OFFICE OF CONSTRUCTION.
   - For other projects revise the sentence with the blank to describe the method of construction control.

(2) Revise the note appropriately for number of piers.

(3) Fill in the abutment and pier blanks. See the tables in the commentary for the pile section for bearing values for typical pile types and conditions [BDM C6.2.4.6]. Because this note is giving previous allowable stress design values, add to the bearing value 50% of the target driving resistance for scour, if pile is designed for scour.

E181/M181: Concrete sealer, bridge seats

CONCRETE SEALER IS TO BE APPLIED TO THE EXPOSED BRIDGE SEAT SURFACE AT THE ABUTMENTS (and at piers?).

Preparation and payment for sealer is covered in the Standard Specifications [IDOT SS 2403.03, P, 3, and 2403.05, C]. Specifications may need to be modified to include the wash for stub abutments. For new construction, place concrete sealer on any abutment seat or pier top below a joint in the deck. For repairs, check with the supervising Section Leader to determine if concrete sealer should be placed.

E183/M183: Approach fills, not in contract, shape berms

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

Use this note when road work and bridge work are on separate projects. Soil under the approach fill may contain compressible material and consolidation may occur. If this is the case, a delay note prior to driving piles may be required.

If a delay is required, the Soils Design Section will give its recommendations.

This note may be combined with E142 if channel excavation is also required.

E184/M184: Prebored holes, integral abutment piles

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET x. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

This note is to be used when prebored holes are required at the abutment. See integral abutment information elsewhere in the manual for where to use prebored holes [BDM 6.5.1.1.1].

Except for bridges with lengths 130 feet or less, the office requires piles to be driven in prebored holes to (1) provide for lateral movement of the pile at integral abutments or (2) eliminate drag load forces induced by settlement. The prebored hole voids are to be filled with natural bentonite slurry. The office believes that the bentonite slurry will provide for good lateral movement of the piles at integral abutments. The Soils Design Section believes that the bentonite slurry is a good material for eliminating drag forces.

E185/M185: Wing slopes, dress after bridge repair

THE BRIDGE CONTRACTOR SHALL DRESS UP THE SLOPES AROUND THE WINGS WHICH ARE DISTURBED DURING CONSTRUCTION. THIS WORK SHALL BE CONSIDERED INCIDENTAL AND NO EXTRA PAYMENT WILL BE MADE.

This note is to be used on repair projects that involve a wing area.

E186/M186: Weathering steel, stain protection for substructure concrete

SUBSTRUCTURE CONCRETE SHALL BE PROTECTED FROM STAINING BY A WRAPPING OF POLYETHYLENE OR SIMILAR MATERIALS WHICH SHALL BE LEFT IN PLACE AND KEPT IN A SERVICEABLE CONDITION UNTIL AFTER THE DECK HAS BEEN PLACED. IF SUBSTRUCTURE CONCRETE IS STAINED, THE STAINS SHALL BE REMOVED BY METHODS APPROVED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH THE PROTECTION AND ANY REQUIRED CLEANING OF THE SUBSTRUCTURE CONCRETE SHALL BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL STEEL".

This note is to be used for weathering steel bridges only.

E187/M187: Pile points, H-piles

CAST IN-ONE-PIECE STEEL PILE POINTS ARE REQUIRED FOR THE (designate which abutment or pier) PILES IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS IM 468.

E188/M188: Concrete barrier rails, slipform method, concrete class

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

Due to quality issues contractors no longer have the option of Class D concrete for placement of barrier rails by the slipform or cast-in-place method.

E189: Reinforcing, English designation on plans

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 is 5/8 inch diameter bar). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING “BAR DESIGNATION”. THE “BAR DESIGNATION” IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE:	3	4	5	6	7	8	9	10	11
BAR DESIGNATION:	10	13	16	19	22	25	29	32	36

The table was revised to fit note sheets more efficiently.

M189: Reinforcing, metric designation on plans

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH “HARD METRIC SIZE”. THESE “HARD METRIC SIZE” BARS ARE NOT AVAILABLE. CURRENTLY THE INDUSTRY IS FURNISHING REINFORCING BARS WITH A “SOFT METRIC BAR DESIGNATION”. ALL “HARD METRIC SIZE” REBARS SHALL BE CONVERTED TO REBAR WITH THE NOTED “SOFT METRIC BAR DESIGNATION”. THE SPACING OR PATTERN OF BAR PLACEMENT SHALL BE AS SHOWN IN THESE PLANS, AND NO CHANGES IN THE SPACING OR THE PATTERN WILL BE ALLOWED WITH THE SUBSTITUTION.

THE “SOFT METRIC BAR DESIGNATION” IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ALL REINFORCING BARS SHOWN ON THE PRESTRESSED CONCRETE BEAM DETAIL SHEETS ARE LABELED WITH BAR NOTATIONS CONSISTENT WITH THE “SOFT METRIC BAR DESIGNATION” SHOWN IN THE TABLE BELOW AND NO CONVERSION FROM HARD METRIC SIZE IS REQUIRED.

HARD METRIC SIZE:	*	10	15	20	*	25	*	30	35
SOFT METRIC BAR DESIGNATION:	10	13	16	19	22	25	29	32	36

*NO EQUIVALENT “HARD METRIC SIZE”

The table was revised to fit note sheets more efficiently.

E200/M200: Precast concrete deck panels, option

AT THE OPTION OF THE BRIDGE CONTRACTOR, THE PRECAST PRESTRESSED CONCRETE DECK PANELS AS SHOWN ON DESIGN SHEET x MAY BE USED IN CONSTRUCTION OF THE BRIDGE DECK IN LIEU OF THE CONVENTIONAL DECK AS SHOWN ON DESIGN SHEET x.

This note to be used when precast concrete deck panels are permissible. See prestressed deck panels criteria [BDM 5.2.4.3] to determine if these panels are appropriate. See the Standard Specifications for basis of payment [IDOT SS 2425.05].

E201/M201: Pretensioned prestressed concrete beams, nonstandard

NON-STANDARD BEAMS WITH HIGHER THAN USUAL CONCRETE STRENGTHS ARE REQUIRED FOR THIS BRIDGE. ADDITIONAL STRANDS ARE ALSO REQUIRED.

Use this note when wider beam spacings are used and the design requires higher concrete strengths and additional strands for some or all of the beams.

E205/M205: Longitudinal grooving, paving by others

LONGITUDINAL GROOVING WILL NOT BE A PART OF THIS CONTRACT, BUT WILL BE DONE BY OTHERS PRIOR TO OPENING THE BRIDGE TO TRAFFIC.

When bridge decks (and bridge approaches) are a separate contract, but will be followed by a paving contract responsible for opening the road to traffic, the designer shall calculate the quantity of longitudinal grooving necessary for the bridge deck for inclusion in the paving plan. This quantity shall be forwarded to the Office of Design for their use in developing quantities for the paving project. Remind the Office of Design that our quantity is only for the bridge deck, and they will need to calculate the quantity for the approach sections.

E206/M206: Longitudinal grooving, is in a tied project

LONGITUDINAL GROOVING WILL NOT BE A PART OF THIS PROJECT, BUT WILL BE INCLUDED IN ANOTHER PROJECT ASSOCIATED WITH THIS CONTRACT.

Prior to using this note, the designer shall verify with the Office of Contracts that the projects will be tied.

E213: Paint, weathering steel, new bridge

THIS STRUCTURE SHALL BE BUILT WITH WEATHERING STEEL. ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. PAINTING REQUIREMENTS FOR THIS STRUCTURE SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS.

Use this note in the general notes for all new structures using weathering steel. A number of other notes particular to weathering steel bridges are required. See E930.

M213: Paint, weathering steel, new bridge

THIS STRUCTURE SHALL BE BUILT WITH WEATHERING STEEL. ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709M GRADE 345W. PAINTING REQUIREMENTS FOR THIS STRUCTURE SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS.

Use this note in the general notes for all new structures using weathering steel. A number of other notes particular to weathering steel bridges are required. See M930.

E214/M214: Paint, non-weathering steel, new bridge

PAINTING REQUIREMENTS FOR THIS STRUCTURE SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS.

Use this note on any new steel structure, which cannot use weathering steel. The Standard Specifications require shop applied inorganic zinc silicate paint. The specifications do allow the use of the topcoat to be optional. If the topcoat is to be used, then the location (example exterior face of exterior beam) must be specified in the plans.

E231/M231: Detour bridge, contractor notification

THE CONTRACTOR SHALL NOTIFY THE DISTRICT 1 MAINTENANCE MANAGER (TELEPHONE NUMBER 515-239-1634) AT LEAST THREE DAYS IN ADVANCE THAT HE WILL BE PICKING UP DETOUR SPANS FOR THIS PROJECT.

The Iowa DOT fabricated detour spans are stored in the Williams maintenance yard in District 1 when not in use. When a project is let that requires the use of detour spans, the contractor is to notify the District 1 Maintenance Manager at least three calendar days in advance of when the detour spans will be picked up. The contractor is to haul the detour spans back to Williams when no longer needed at the detour site and stored as directed by the District 1 Maintenance Manager.

At the time the designer receives the project he or she should check with the preliminary bridge section to make sure that the needed number of spans will be available and ask the preliminary bridge section to reserve the needed spans.

Because painting of steel structures is environmentally sensitive and has increased the cost of painting, detour spans are not to be painted after each use. No mention of painting detour spans shall be made on the design plans. If it is determined at some time in the future that some or all of our temporary detour spans need to be painted, the painting will be done by a separate contract for painting only.

The detour spans are detailed on standard sheets [OBS SS 1035-1035E].

E233/M233: Nuclear density checks, deck test wells

TWO COURSE DECKS USING LOW SLUMP OVERLAY MIXES WILL REQUIRE TEST WELLS BE CAST IN THE FIRST CONCRETE DECK COURSE. TEST WELLS SHALL BE LOCATED AS NOTED IN MATERIALS IM 204, APPENDIX M.

PRIOR TO DECK PLACEMENT THE CONTRACTOR SHALL SUBMIT A TEST WELL LOCATION PLAN TO THE ENGINEER FOR APPROVAL. THE PLAN SHALL SHOW THE PROPOSED EXTENT OF EACH SECOND STAGE PLACEMENT AND PROPOSED TEST WELL LOCATIONS. ALL COSTS ASSOCIATED WITH CONSTRUCTING THE TEST WELLS SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE BRIDGE OR HIGH PERFORMANCE STRUCTURAL CONCRETE ?????.

On some bridges a two-course bridge deck may be specified. This note is required when the second course is a low slump concrete overlay. Testing is not required if a high performance overlay is used. The top course usually will not be thick enough to accommodate the probe of a nuclear density gauge designed to determine the in-place density of plastic concrete. The probe is somewhat longer than 2 inches (50 mm) in length. Therefore, design plans should have this note. Cost shall be incidental to Structural Concrete, Bridge or High Performance Structural Concrete depending on the concrete specified to be used for the bridge deck.

E234: Bridge deck, two-course, surface preparation

NO CURING COMPOUNDS SHALL BE USED ON THE SURFACE OF THE CONCRETE DECK (FIRST COURSE).

THE SURFACE OF THE FIRST COURSE SHALL BE INTENTIONALLY ROUGHENED (COMBED) TO A MINIMUM DEPTH OF 1/8" AND A MAXIMUM DEPTH OF 1/4". THIS ROUGHENED SURFACE SHALL BE ACCOMPLISHED ON PLASTIC CONCRETE BY USE OF A MECHANICAL DEVICE AS PRESCRIBED IN ARTICLE 2301.03, H, OF THE STANDARD SPECIFICATIONS OR ON HARDENED CONCRETE BY UNIFORMLY SCARIFYING THE ENTIRE DECK AREA. THE INTENT IS TO GIVE THE CONTRACTOR THE OPTION OF ACHIEVING THE REQUIRED SURFACE ROUGHNESS ON THE PLASTIC OR HARDENED CONCRETE SO THE SECOND COURSE WILL BOND PROPERLY.

This note replaces E923 and should be used with two course decks for new bridges. Curing compounds should not be allowed, so the second course will bond properly.

M234: Bridge deck, two-course, surface preparation

NO CURING COMPOUNDS SHALL BE USED ON TOP SURFACE OF THE CONCRETE DECK (FIRST COURSE).

THE SURFACE OF THE FIRST COURSE SHALL BE INTENTIONALLY ROUGHENED (COMBED) TO A MINIMUM DEPTH OF 3 mm AND A MAXIMUM DEPTH OF 6 mm. THIS ROUGHENED SURFACE SHALL BE ACCOMPLISHED ON PLASTIC CONCRETE BY USE OF A MECHANICAL DEVICE AS PRESCRIBED IN ARTICLE 2301.03, H, OF THE STANDARD SPECIFICATIONS OR ON HARDENED CONCRETE BY UNIFORMLY SCARIFYING THE ENTIRE DECK AREA. THE INTENT IS TO GIVE THE CONTRACTOR THE OPTION OF ACHIEVING THE REQUIRED SURFACE ROUGHNESS ON THE PLASTIC OR HARDENED CONCRETE SO THE SECOND COURSE WILL BOND PROPERLY.

This note replaces M923 and should be used with two course decks for new bridges. Curing compounds should not be allowed, so the second course will bond properly.

11.4 Future notes

11.4.1 Index

Reserved

11.4.2 Listing

Reserved

11.5 Bridge repair

These notes are placed on the general notes sheet, on the situation plan and quantities sheet, and on specific detail sheets.

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11.5.2 Listing

E400A/M400A: Deck survey, manual sounding plot

PLAN QUANTITY OF DECK REPAIR IS BASED ON THE "SURVEY PLOT" AS SHOWN IN THESE PLANS. HATCHED PORTIONS REPRESENT CLASS A BRIDGE DECK REPAIR. CROSS HATCHED PORTIONS, IF SHOWN, REPRESENT CLASS B BRIDGE DECK REPAIR. ACTUAL SPALLED AND HOLLOW AREAS, AS DETERMINED BY THE ENGINEER AT THE TIME OF CONSTRUCTION SHALL BE REPAIRED.

This note is typically used when the deck soundings have been done manually.

E400B/M400B: Deck survey, no plot

NO PRELIMINARY DECK SURVEY IS SHOWN. THE PLAN QUANTITY FOR "CLASS A BRIDGE DECK REPAIR" IS ESTIMATED AS ___ OF THE TOTAL DECK AREA. THE ACTUAL QUANTITY IS DETERMINED BY THE ENGINEER AFTER THE H.M.A SURFACING HAS BEEN REMOVED. ACTUAL SPALLED AND HOLLOW AREAS AS DETERMINED BY THE ENGINEER SHALL BE REPAIRED.

This note is used when there is HMA surfacing on the deck and no deck soundings are possible. Use 100% of deck area for shorter bridges and 50% of deck area for longer bridges. Consult with the supervising Section Leader on percentage to use.

E400C/M400C: Deck survey, delamtect and manual sounding plot

PLAN QUANTITY OF DECK REPAIR IS BASED ON TWO TIMES THE SHADED AREAS PLUS THE BOUNDED AREAS SHOWN ON THE "SURVEY PLOT" IN THESE PLANS. SHADED AREAS REPRESENT CLASS A BRIDGE DECK REPAIR FOUND BY DELAMTECT PLOT. BOUNDED AREAS INCLUDE H.M.A. PATCH OR SPALLED AREAS NOT RECORDED BY THE DELAMTECT AND/OR THE SQUARING UP OF THE REPAIR AREAS. ACTUAL SPALLED AND HOLLOW AREAS AS DETERMINED BY THE ENGINEER AT THE TIME OF CONSTRUCTION SHALL BE REPAIRED.

This note is used when the delamtect plot has areas added manually. Consult with the supervising Section Leader if the "two times" should be adjusted. Normal procedure would be to add the bounded area to the "two times" delamtect area, even though the bounded areas may overlap the delamtect area. Accuracy of this measurement does not justify further refinement of this quantity.

E400D/M400D: Deck survey, delamtect plot

PLAN QUANTITY OF DECK REPAIR IS BASED ON TWO TIMES THE SHADED AREAS SHOWN ON THE "SURVEY PLOT" IN THESE PLANS. SHADED AREAS REPRESENT CLASS A BRIDGE DECK REPAIR FOUND BY THE DELAMTECT PLOT. ACTUAL SPALLED AND HOLLOW AREAS AS DETERMINED BY THE ENGINEER AT THE TIME OF CONSTRUCTION, SHALL BE REPAIRED.

This note is used when the delamtect plot has had nothing manually added to it.

E410A: Deck surfacing, repair, and overlay, beam bridge

PRESENT DECK THICKNESS IS ABOUT _____ INCHES. THE CONTRACTOR SHALL EXERCISE CARE IN REMOVING CONCRETE IN ORDER TO PREVENT UNNECESSARY UNBONDING OF REINFORCING STEEL.

This note is typically used on beam type bridges.

M410A: Deck surfacing, repair, and overlay, beam bridge

PRESENT DECK THICKNESS IS ABOUT _____ mm. THE CONTRACTOR SHALL EXERCISE CARE IN REMOVING CONCRETE IN ORDER TO PREVENT UNNECESSARY UNBONDING OF REINFORCING STEEL.

This note is typically used on beam type bridges.

E410B: Deck surfacing, repair, and overlay, slab bridge

PRESENT DECK THICKNESS IS ABOUT _____ INCHES. THE CONTRACTOR SHALL EXERCISE CARE IN ORDER TO PREVENT UNNECESSARY REMOVAL OF CONCRETE BELOW THE TOP OF THE TOP REINFORCING. THE ENERGY OF HAND TOOLS SHALL BE RESTRICTED NEAR THE BOTTOM OF THE DESIGNATED CLASS A REPAIR AREAS IN ORDER TO PREVENT UNBONDING OF REINFORCING. NO CONCRETE SHALL BE REMOVED BELOW THE TOP OF THE TOP LONGITUDINAL REINFORCING WITHOUT PRIOR PERMISSION FROM THE BRIDGE ENGINEER.

This note is used on bridge superstructures where the main reinforcing is parallel with the roadway such as a concrete slab bridge.

M410B: Deck surfacing, repair, and overlay, slab bridge

PRESENT DECK THICKNESS IS ABOUT _____ mm. THE CONTRACTOR SHALL EXERCISE CARE IN ORDER TO PREVENT UNNECESSARY REMOVAL OF CONCRETE BELOW THE TOP OF THE TOP REINFORCING. THE ENERGY OF HAND TOOLS SHALL BE RESTRICTED NEAR THE BOTTOM OF THE DESIGNATED CLASS A REPAIR AREAS IN ORDER TO PREVENT UNBONDING OF REINFORCING. NO CONCRETE SHALL BE REMOVED BELOW THE TOP OF THE TOP LONGITUDINAL REINFORCING WITHOUT PRIOR PERMISSION FROM THE BRIDGE ENGINEER.

This note is used on bridge superstructures where the main reinforcing is parallel with the roadway such as a concrete slab bridge.

E410C: Deck surfacing, repair, and overlay, shallow reinforcing (rare)

PRESENT DECK THICKNESS IS ABOUT _____ INCHES. THE DECK REINFORCING IS QUITE SHALLOW FOR A PORTION OF THE DECK AREA. IN THOSE AREAS WHERE REINFORCING IS LESS THEN 1/4 " CLEAR BELOW THE ORIGINAL FINISHED SURFACE, THE BOTTOM LIMIT OF BRIDGE DECK OVERLAY WILL BE CONSIDERED AS THE TOP OF THE TOP REINFORCING. UNSOUND CONCRETE BELOW THE TOP OF THE TOP REINFORCING SHALL BE REPAIRED AS CLASS A BRIDGE DECK REPAIR. THE CONTRACTOR WILL BE REQUIRED TO CAREFULLY REGULATE SCARIFYING DEPTH AND EMPLOY HAND METHODS AS NECESSARY IN ORDER TO PREVENT DAMAGE OR UNBONDING OF REINFORCING.

This note is only used if there is very little cover over top reinforcing, which should be quite infrequent.

M410C: Deck surfacing, repair, and overlay, shallow reinforcing (rare)

PRESENT DECK THICKNESS IS ABOUT _____ mm. THE DECK REINFORCING IS QUITE SHALLOW FOR A PORTION OF THE DECK AREA. IN THOSE AREAS WHERE REINFORCING IS LESS THEN 5 mm CLEAR BELOW THE ORIGINAL FINISHED SURFACE,

THE BOTTOM LIMIT OF BRIDGE DECK OVERLAY WILL BE CONSIDERED AS THE TOP OF THE TOP REINFORCING. UNSOUND CONCRETE BELOW THE TOP OF THE TOP REINFORCING SHALL BE REPAIRED AS CLASS A BRIDGE DECK REPAIR. THE CONTRACTOR WILL BE REQUIRED TO CAREFULLY REGULATE SCARIFYING DEPTH AND EMPLOY HAND METHODS AS NECESSARY IN ORDER TO PREVENT DAMAGE OR UNBONDING OF REINFORCING.

This note is only used if there is very little cover over top reinforcing, which should be quite infrequent.

E410D: Deck surfacing, repair, and overlay, re-overlay beam bridge

PRESENT DECK THICKNESS IS ABOUT _____ INCHES, INCLUDING EXISTING OVERLAY. THE CONTRACTOR SHALL EXERCISE CARE IN REMOVING CONCRETE IN ORDER TO PREVENT UNNECESSARY UNBONDING OF REINFORCING STEEL.

M410D: Deck surfacing, repair, and overlay, re-overlay beam bridge

PRESENT DECK THICKNESS IS ABOUT ___ mm, INCLUDING EXISTING OVERLAY. THE CONTRACTOR SHALL EXERCISE CARE IN REMOVING CONCRETE IN ORDER TO PREVENT UNNECESSARY UNBONDING OF REINFORCING STEEL.

E410E: Deck surfacing, repair, and overlay, re-overlay slab bridge

PRESENT DECK THICKNESS IS ABOUT _____ INCHES, INCLUDING EXISTING OVERLAY. THE CONTRACTOR SHALL EXERCISE CARE IN ORDER TO PREVENT UNNECESSARY REMOVAL OF CONCRETE BELOW THE TOP OF THE TOP REINFORCING. THE ENERGY OF HAND TOOLS SHALL BE RESTRICTED NEAR THE BOTTOM OF THE DESIGNATED CLASS A REPAIR AREAS IN ORDER TO PREVENT UNBONDING OF REINFORCING. NO CONCRETE SHALL BE REMOVED BELOW THE TOP OF THE TOP LONGITUDINAL REINFORCING WITHOUT PRIOR PERMISSION FROM THE BRIDGE ENGINEER.

M410E: Deck surfacing, repair, and overlay, re-overlay slab bridge

PRESENT DECK THICKNESS IS ABOUT ___ mm, INCLUDING EXISTING OVERLAY. THE CONTRACTOR SHALL EXERCISE CARE IN ORDER TO PREVENT UNNECESSARY REMOVAL OF CONCRETE BELOW THE TOP OF THE TOP REINFORCING. THE ENERGY OF HAND TOOLS SHALL BE RESTRICTED NEAR THE BOTTOM OF THE DESIGNATED CLASS A REPAIR AREAS IN ORDER TO PREVENT UNBONDING OF REINFORCING. NO CONCRETE SHALL BE REMOVED BELOW THE TOP OF THE TOP LONGITUDINAL REINFORCING WITHOUT PRIOR PERMISSION FROM THE BRIDGE ENGINEER.

E411: Deck surfacing, repair, and overlay, slab bridge, no top reinforcing

THE MINIMUM DEPTH FOR CLASS A REPAIR IS TO BE 1 1/2 INCHES IN AREAS WHERE TOP REINFORCING IS NOT PRESENT.

This note is used when a slab bridge does not have top steel for some or all of the slab.

M411: Deck surfacing, repair, and overlay, slab bridge, no top reinforcing

THE MINIMUM DEPTH FOR CLASS A REPAIR IS TO BE 40 mm IN AREAS WHERE TOP REINFORCING IS NOT PRESENT.

This note is used when a slab bridge does not have top steel for some or all of the slab.

E412: Deck surfacing, repair, and overlay, re-overlay

THE BRIDGE DECK IS COVERED WITH A _____ INCH THICK PORTLAND CEMENT CONCRETE OVERLAY. THE CONTRACTOR SHALL NOTE THE REDEFINING OF THE CLASSIFICATION LINE (BOUNDARY BETWEEN REPAIR AND OVERLAY) FOR THIS PROJECT DUE TO THE EXISTING _____ INCH OVERLAY. THE CLASSIFICATION LINE WILL BE DEFINED AS _____ INCHES BELOW THE TOP OF EXISTING OVERLAY. THIS WILL

NECESSITATE THE REMOVAL OF THE EXISTING BRIDGE DECK OVERLAY BEFORE PLACING THE PROPOSED NEW BRIDGE DECK OVERLAY.

ALL COSTS ASSOCIATED WITH THE REMOVAL OF THE EXISTING OVERLAY SHALL BE INCLUDED IN THE BID ITEM "REMOVAL OF EXISTING P.C.C. OVERLAY". REMOVAL OF EXISTING OVERLAY SHALL BE COMPUTED IN SQUARE YARDS FROM THE MEASUREMENT OF AREAS REMOVED. THE CONTRACTOR WILL BE PAID THE CONTRACT PRICE PER SQUARE YARD FOR FURNISHING ALL EQUIPMENT AND LABOR NECESSARY TO REMOVE THE CONCRETE TO WITHIN 1/4 INCH ABOVE THE CLASSIFICATION LINE. ALL COSTS, INCLUDING FURNISHING EQUIPMENT AND LABOR, ASSOCIATED WITH REMOVAL OF THE NEXT 1/4 INCH OF CONCRETE (TO THE CLASSIFICATION LINE) SHALL BE INCLUDED IN THE BID ITEM "DECK OVERLAY".

UPON COMPLETION OF THE REMOVAL OF CONCRETE DOWN TO THE CLASSIFICATION LINE, THE ENGINEER SHALL DETERMINE THE AREAS OF BRIDGE DECK TO BE REPAIRED AS "DECK REPAIR, CLASS A". ACTUAL HOLLOW AREAS, AS DETERMINED BY THE ENGINEER, SHALL BE REPAIRED.

The existing overlay thickness shall include the original surface raise and scarification. The depth to the new classification line shall be 1/4" (5 mm) below the original classification line.

Discuss with the supervising Section Leader the possibility of requesting concrete cores from the bridge deck to determine the integrity of the original deck and if overlay is a wise investment.

The second paragraph of this note is necessary to provide method of measurement and basis of payment for the bid item "Removal of Existing P.C.C. Overlay", since it is not included in the Standard Specifications.

The last 1/4" (5 mm) of concrete removal is included in the bridge deck overlay item. This eliminates the need of redefining bridge deck overlay (which includes 1/4" (5 mm) of deck scarification as per the Standard Specifications [IDOT SS 2413.01, C]).

M412: Deck surfacing, repair, and overlay, re-overlay

THE BRIDGE DECK IS COVERED WITH A ___ mm THICK PORTLAND CEMENT CONCRETE OVERLAY. THE CONTRACTOR SHALL NOTE THE REDEFINING OF THE CLASSIFICATION LINE (BOUNDARY BETWEEN REPAIR AND OVERLAY) FOR THIS PROJECT DUE TO THE EXISTING OVERLAY. THE CLASSIFICATION LINE WILL BE DEFINED AS ___ mm BELOW THE TOP OF EXISTING OVERLAY. THIS WILL NECESSITATE THE REMOVAL OF THE EXISTING BRIDGE DECK OVERLAY BEFORE PLACING THE PROPOSED NEW BRIDGE DECK OVERLAY.

ALL COSTS ASSOCIATED WITH THE REMOVAL OF THE EXISTING OVERLAY SHALL BE INCLUDED IN THE BID ITEM "REMOVAL OF EXISTING P.C.C. OVERLAY". REMOVAL OF EXISTING OVERLAY SHALL BE COMPUTED IN SQUARE METERS FROM THE MEASUREMENT OF AREAS REMOVED. THE CONTRACTOR WILL BE PAID THE CONTRACT PRICE PER SQUARE METER FOR FURNISHING ALL EQUIPMENT AND LABOR NECESSARY TO REMOVE THE CONCRETE TO WITHIN 5 mm ABOVE THE CLASSIFICATION LINE. ALL COSTS, INCLUDING FURNISHING EQUIPMENT AND LABOR, ASSOCIATED WITH REMOVAL OF THE NEXT 5 mm OF CONCRETE (TO THE CLASSIFICATION LINE) SHALL BE INCLUDED IN THE BID ITEM "DECK OVERLAY".

UPON COMPLETION OF THE REMOVAL OF CONCRETE DOWN TO THE CLASSIFICATION LINE, THE ENGINEER SHALL DETERMINE THE AREAS OF BRIDGE DECK TO BE

REPAIRED AS "DECK REPAIR, CLASS A". ACTUAL HOLLOW AREAS, AS DETERMINED BY THE ENGINEER, SHALL BE REPAIRED.

The existing overlay thickness shall include the original surface raise and scarification. The depth to the new classification line shall be 1/4" (5 mm) below the original classification line.

Discuss with the supervising Section Leader the possibility of requesting concrete cores from the bridge deck to determine the integrity of the original deck and if overlay is a wise investment.

The second paragraph of this note is necessary to provide method of measurement and basis of payment for the bid item "Removal of Existing P.C.C. Overlay", since it is not included in the Standard Specifications.

The last 1/4" (5 mm) of concrete removal is included in the bridge deck overlay item. This eliminates the need of redefining bridge deck overlay (which includes 1/4" (5 mm) of deck scarification as per the Standard Specifications [IDOT SS 2413.01, C]).

E415: Deck surfacing, repair, and overlay, HPC-O concrete curing

IF THE CONTRACTOR USES HPC-O MIX THE SURFACE SHALL BE CURED FOR AT LEAST 168 HOURS. FOR THE FIRST 96 HOURS, KEEP THE BURLAP CONTINUOUSLY WET BY MEANS OF AN AUTOMATIC SPRINKLING OR WETTING SYSTEM. AFTER 96 HOURS, THE CONTRACTOR MAY COVER THE WET BURLAP WITH A LAYER OF 4 MIL POLYETHYLENE FILM FOR A MINIMUM OF 72 HOURS IN LIEU OF USING THE SPRINKLING OR WETTING SYSTEM. IF THE POLYETHYLENE FILM IS USED, THE CONTRACTOR SHALL BE REQUIRED TO VERIFY THE BURLAP REMAINS WET FOR THE 72 HOUR PERIOD.

Article 2413.03, F, 2, a of the Standard Specifications states that Class HPC-O overlay mix should be allowed to cure for 168 hours vs. the 72 hour cure for low slump overlay mix. This requirement is qualified to apply only when the deck overlay area is greater than 1800 sq yd (900 sq yd per lane). (Note this requirement is in the GS 9005). The intent is that a longer cure is beneficial when using the HPC-O mix however it should not be the controlling operation. With a larger deck, the contractor will not be able to pour one lane of overlay in a one day operation so other factors come into play in the project schedule. This was based on feedback from the industry.

The Office of Construction proposed to modify the Specifications to indicate when this 1800 sq yd value was exceeded the cure time would be extended to 168 hours if noted on the plans. The Specifications Committee decided to put the cure time back to 72 hours for all overlay placements with the intent that a plan note for a 168 hour cure could always be placed on the plans to override the 72 hour cure time noted in the specifications.

The bridge office should be aware of this situation and consider a longer cure time when a lane of overlay placement is greater than 900 sq yd. It is the intent that for these larger placements, it would be the District or the Office of Construction making a request to the bridge office to consider this note. If the design engineer recognizes the situation it could be pursued by the engineer but he/she is not required to do so. As a minimum the design engineer should send a note to the District and Office of Construction making them aware of the project and stating the note will not be put on the plans unless notified otherwise.

E420/M420: Stage construction, maintain traffic

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE LANE TRAFFIC MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

E421/M421: Stage construction, reverse stages option

CONSTRUCTION STAGES I & II AS DETAILED ON THESE PLANS MAY BE REVERSED AT THE CONTRACTOR'S OPTION SUBJECT TO THE ENGINEER'S APPROVAL.

Use this note only when stage numbers are shown on the plans and it is feasible to reverse the staging.

E422: Stage construction, construction options, rebuilding a backwall

BEFORE PROCEEDING WITH BRIDGE DECK OVERLAY AND BRIDGE DECK REPAIR THE CONTRACTOR MAY COMPLETE ALL STAGES OF OTHER CONSTRUCTION. ANY CONSTRUCTION SHALL HAVE STAGE LIMITS, TEMPORARY BARRIER RAIL AND TRAFFIC CONTROL AS DETAILED ON THESE PLANS. TEMPORARY BARRIER RAIL AND TRAFFIC CONTROL MAY BE ADJUSTED TO FIT THE ACTUAL WORK AND STORAGE AREA. WHEN BACKWALLS AND/OR APPROACH SECTIONS ARE TO BE REBUILT TO A RAISED SURFACE, AND WHEN DECK OVERLAY IS NOT A PART OF THE SAME STAGE, THE CONTRACTOR SHALL PROVIDE FOR PROFILE TRANSITION WITH H.M.A. SURFACING. PROFILE TRANSITION SHALL BE TAPERED AT A RATE OF 25' FOR 1 1/2 INCHES OF RAISE. THE H.M.A. TRANSITION MATERIAL SHALL BE A COMMERCIAL GRADE HOT SURFACING MIX OR A MIX APPROVED BY THE ENGINEER H.M.A. MAY BE PLACED BY HAND METHODS AND MAY BE COMPACTED BY ANY APPROVED METHOD. ALL COSTS FOR ADDITIONAL TRAFFIC CONTROL, REPOSITI0NING OF BARRIER AND H.M.A. SURFACING SHALL BE BORNE BY THE CONTRACTOR.

Usually this note is only necessary when plans indicate rebuilding a backwall.

M422: Stage construction, construction options, rebuilding a backwall

BEFORE PROCEEDING WITH BRIDGE DECK OVERLAY AND BRIDGE DECK REPAIR THE CONTRACTOR MAY COMPLETE ALL STAGES OF OTHER CONSTRUCTION. ANY CONSTRUCTION SHALL HAVE STAGE LIMITS, TEMPORARY BARRIER RAIL AND TRAFFIC CONTROL AS DETAILED ON THESE PLANS. TEMPORARY BARRIER RAIL AND TRAFFIC CONTROL MAY BE ADJUSTED TO FIT THE ACTUAL WORK AND STORAGE AREA. WHEN BACKWALLS AND/OR APPROACH SECTIONS ARE TO BE REBUILT TO A RAISED SURFACE, AND WHEN DECK OVERLAY IS NOT A PART OF THE SAME STAGE, THE CONTRACTOR SHALL PROVIDE FOR PROFILE TRANSITION WITH H.M.A. SURFACING. PROFILE TRANSITION SHALL BE TAPERED AT A RATE OF 7600 mm FOR 40 mm OF RAISE. THE H.M.A. TRANSITION MATERIAL SHALL BE A COMMERCIAL GRADE HOT SURFACING MIX OR A MIX APPROVED BY THE ENGINEER. H.M.A. MAY BE PLACED BY HAND METHODS AND MAY BE COMPACTED BY ANY APPROVED METHOD. ALL COSTS FOR ADDITIONAL TRAFFIC CONTROL, REPOSITI0NING OF BARRIER AND H.M.A. SURFACING SHALL BE BORNE BY THE CONTRACTOR.

Usually this note is only necessary when plans indicate rebuilding a backwall.

M425: Metric project, dimensions

ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED OR SHOWN.

ALL ELEVATIONS ON THESE PLANS SHOWN IN METERS (m).

ALL STATIONS SHOWN IN METERS (m).

M426: Reinforcing, metric substitution

IF EPOXY COATED NUMBER 20 METRIC BARS ARE NOT FEASIBLY AVAILABLE IN THE QUANTITY REQUIRED, EPOXY COATED NUMBER 6 IMPERIAL BARS MAY BE SUBSTITUTED AT NO CHANGE IN COST.

Because of contractors' current inability to obtain epoxy coated number 20 metric bars in job-size quantity, this note shall be added to all rail retrofit designs.

E429: Superstructure raise, vertical tolerance and horizontal support

THE BRIDGE SUPERSTRUCTURE IS TO BE RAISED AS A SINGLE UNIT USING A SUFFICIENT NUMBER OF HYDRAULIC JACKS AT EACH SUPPORT. IN ORDER TO PREVENT OVERSTRESSING OF THE SUPERSTRUCTURE MEMBERS, THE ENTIRE SUPERSTRUCTURE SHALL BE RAISED UNIFORMLY AND SIMULTANEOUSLY, WITH NO MORE THAN A ¼ INCH ELEVATION DIFFERENCE BETWEEN ADJACENT BEAMS. THE ELEVATION DIFFERENCE MAY ACCUMULATE ACROSS THE BRIDGE, BUT THERE SHALL BE NO MORE THAN A 1 INCH TOTAL ACCUMULATION. LONGITUDINAL AND LATERAL SUPPORT OF THE SUPERSTRUCTURE SHALL BE PROVIDED DURING RAISING OPERATIONS TO PREVENT HORIZONTAL MOVEMENT OF THE SUPERSTRUCTURE.

Include this note with the general notes when a superstructure needs to be raised. Even with a correct jacking setup contractors cannot raise the superstructure perfectly uniformly and need a small amount of vertical tolerance. The ¼ inch tolerance is based on information from the field for a successful superstructure raising project.

E430/M430: Repair project, general outline of work

THIS DESIGN IS FOR REPAIRS TO THE EXISTING ___. COPIES OF ORIGINAL DESIGN PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES. REPAIR SHALL CONSIST OF:

1. _____

2. _____

The general notes should lead off with the above. Fill in a description of the existing structure and the highway it is on and the feature crossed. Specify in general the extent of work covered in the plans (bridge and road) for the project such as bridge deck repair and overlay, removal of existing handrail, placing new cast-in-place barrier rail, replacing guardrail, etc.

E431/M431: Curb repair, concrete notes

AREAS OF CURB INDICATED ON THE "SURVEY PLOT" OR DESIGNATED BY THE ENGINEER ARE TO BE REPAIRED USING CONCRETE REPAIR NOTES AND DETAILS INCLUDED IN THESE PLANS.

Repair of curbs is addressed better with the concrete repair notes and details than with the note specifying Class A Bridge Deck Repair. Include the concrete repair detail sheet [OBS SS 1045] in the plans. Bid this area of repair as "Concrete Repair".

E432: Overlay construction joint, temporary barrier rail conflict

SCREED EXTENSION OR OVERLAY BEYOND THE LONGITUDINAL CONSTRUCTION JOINT MAY BE LESS THAN THE 6 INCHES REQUIRED BY ARTICLE 2413.03, A, 4, OF THE STANDARD SPECIFICATIONS. THE ENGINEER MAY REQUIRE ADDITIONAL VIBRATION OR SPECIAL FINISHING PROCEDURES ADJACENT TO THE LONGITUDINAL CONSTRUCTION JOINT.

Use this note only when the temporary barrier rail is placed less than 8" from the overlay construction joint.

M432: Overlay construction joint, temporary barrier rail conflict

SCREED EXTENSION OR OVERLAY BEYOND THE LONGITUDINAL CONSTRUCTION JOINT MAY BE LESS THAN THE 150 mm REQUIRED BY ARTICLE 2413.03, A, 4, OF THE

STANDARD SPECIFICATIONS. THE ENGINEER MAY REQUIRE ADDITIONAL VIBRATION OR SPECIAL FINISHING PROCEDURES ADJACENT TO THE LONGITUDINAL CONSTRUCTION JOINT.

Use this note only when the temporary barrier rail is placed less than 200 mm from the overlay construction joint.

E433: Surface raise, restriction

SURFACE RAISE, AS SHOWN ON THE PLANS, SHALL BE CONSIDERED A MINIMUM. IN ORDER TO LIMIT THE ADDITIONAL DEAD LOAD SURFACE RAISE SHALL BE RESTRICTED TO A MAXIMUM OF 1/2 " MORE THAN SHOWN ON THE PLANS. PROFILE MAY BE ADJUSTED TO THE EXTENT POSSIBLE WITHIN THESE LIMITS.

M433: Surface raise, restriction

SURFACE RAISE, AS SHOWN ON THE PLANS, SHALL BE CONSIDERED A MINIMUM. IN ORDER TO LIMIT THE ADDITIONAL DEAD LOAD SURFACE RAISE SHALL BE RESTRICTED TO A MAXIMUM OF 13 mm MORE THAN SHOWN ON THE PLANS. PROFILE MAY BE ADJUSTED TO THE EXTENT POSSIBLE WITHIN THESE LIMITS.

E434/M434: Existing structure, field verify dimensions

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

E435/M435: Existing structure, field verify dimensions, steel

ALL DIMENSIONS REQUIRED TO FABRICATE NEW STRUCTURAL STEEL SHALL BE FIELD VERIFIED BY THE CONTRACTOR.

When existing structural steel is replaced or new steel is attached to existing members include this note. Three examples when this note would be required are:

1. When replacing damaged truss members.
2. When replacing damaged rail members.
3. When adding raise plates to sliding plate expansion devices.

E436/M436: Existing structure, faint lines

FAINT LINES ON PLANS INDICATE EXISTING PORTIONS OF THE BRIDGE.

E437: Reinforcing, minimum clearances

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

M437: Reinforcing, minimum clearances

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.

E438/M438: Concrete sealer, abutment seats

IN ADDITION TO THE REQUIREMENTS OF ARTICLE 2413.03, G, OF THE STANDARD SPECIFICATIONS, BOTH ABUTMENT BRIDGE SEATS SHALL HAVE AN APPLICATION OF CONCRETE SEALER IN ACCORDANCE WITH ARTICLE 2403.03, P, 3, OF THE STANDARD SPECIFICATIONS.

Check with the supervising Section Leader for guidance for placing sealer on existing abutments.

All primary and interstate bridges with any type of expansion device shall have concrete sealer applied to the exposed bridge seat surfaces.

E440/M440: Removal, scheduled items

THE LUMP SUM BID FOR "REMOVALS, AS PER PLAN" SHALL INCLUDE ALL COSTS ASSOCIATED WITH REMOVING THE _____. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE SPECIFICATIONS. ANY DAMAGE TO ANY STEEL OR CONCRETE NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.

Use this note when the removal includes partial removal of a structure. Describe what is to be removed.

E441A: Removal, handrail, property of contractor

THE BID ITEM "REMOVAL OF EXISTING HANDRAIL + END POST" SHALL INCLUDE ALL COSTS ASSOCIATED WITH DISMANTLING THE EXISTING _____ HANDRAIL (APPROXIMATELY _____ L.F. AND _____ POSTS). THE HANDRAILS ARE TO BECOME THE PROPERTY OF THE CONTRACTOR.

Specify steel or aluminum handrail, length of rail, and number of posts. If the bridge has no end posts, use the bid item “REMOVAL OF EXISTING HANDRAIL”.

M441A: Removal, handrail, property of contractor

THE BID ITEM "REMOVAL OF EXISTING HANDRAIL + END POST" SHALL INCLUDE ALL COSTS ASSOCIATED WITH DISMANTLING THE EXISTING _____ HANDRAIL (APPROXIMATELY _____ mm AND _____ POSTS). THE HANDRAILS ARE TO BECOME THE PROPERTY OF THE CONTRACTOR.

Specify steel or aluminum handrail, length of rail, and number of posts. If the bridge has no end posts, use the bid item “REMOVAL OF EXISTING HANDRAIL”.

E441B: Removal, handrail, property of Iowa DOT

THE BID ITEM "REMOVE AND STOCKPILE EXISTING HANDRAIL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE DISMANTLING, HAULING AND STORING OF BOTH OF THE HANDRAILS (APPROXIMATELY _____ L.F. OF RAIL AND _____ POSTS). THE RAILS, POSTS AND HARDWARE ARE TO BE HAULED TO THE IOWA D.O.T. MAINTENANCE YARD AT _____. ANCHOR BOLTS NEED NOT BE SALVAGED.

This note should only be used if there is a specific request from the field office for the Iowa DOT to keep the railing. See also E131/M131.

M441B: Removal, handrail, property of Iowa DOT

THE BID ITEM "REMOVE AND STOCKPILE EXISTING HANDRAIL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE DISMANTLING, HAULING AND STORING OF BOTH OF THE HANDRAILS (APPROXIMATELY _____ mm OF RAIL AND _____ POSTS). THE RAILS, POSTS AND HARDWARE ARE TO BE HAULED TO THE IOWA D.O.T. MAINTENANCE YARD AT _____. ANCHOR BOLTS NEED NOT BE SALVAGED.

This note should only be used if there is a specific request from the field office for the Iowa DOT to keep the railing. See also E131/M131.

E442/M442: Removal, HMA overlay

THE PRICE BID FOR "REMOVAL OF ASPHALT CEMENT CONCRETE SURFACING" SHALL BE CONSIDERED FULL COMPENSATION FOR REMOVAL OF THE EXISTING H.M.A.

OVERLAY TO THE LIMITS SHOWN. THE REMOVED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

Use this note when a bridge has an HMA overlay.

E443/M443: Keyways, dimensions and bevel

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

There has been some confusion in the field on the keyway dimensions for construction joints, whether they are based on nominal or actual dimensions (for example, 2 x 4 or 1½ inches x 3½ inches). Also, questions have been raised about the keyway bevel. Contractors generally prefer as much bevel as possible to make it easier to remove the keyway forms after casting; however, the office would like to limit the bevel to provide a better shear plane across the joint.

Provide this note on all projects currently being developed. The Assistant Bridge Engineer will be working with the Specifications Committee to include information in the Iowa DOT Standard Specifications.

E445/M445: Heavy construction equipment, bridge protection during beam replacement

HEAVY CONSTRUCTION EQUIPMENT WILL NOT BE ALLOWED ON THE BRIDGE DURING CONSTRUCTION UNLESS PRIOR WRITTEN APPROVAL OF THE ENGINEER IS OBTAINED. APPROVAL SHALL BE OBTAINED BY SUBMITTING A WRITTEN REQUEST TO THE ENGINEER. THIS REQUEST SHALL INCLUDE THE FOLLOWING:

1. A DETAILED PLAN ADEQUATELY DESCRIBING THE EQUIPMENT AND HOW IT IS PROPOSED TO BE USED. THIS PLAN SHALL CONTAIN, AS A MINIMUM, THE FOLLOWING INFORMATION:

A. THE CONFIGURATION AND WEIGHT OF THE EQUIPMENT PROPOSED TO BE PLACED ON THE BRIDGE.

B. THE PROPOSED LOCATION(S) OF THE EQUIPMENT ON THE BRIDGE DURING ALL LIFTING OPERATIONS.

C. THE WEIGHT OF ALL PROPOSED LIFTS TO BE MADE BY THE EQUIPMENT.

D. THE LOAD TO ALL WHEELS/AXLES/OUTRIGGERS/CRAWLERS RESULTING FROM THE PROPOSED LIFTING OPERATIONS, DURING ALL CRITICAL PHASES OF THE LIFTING OPERATIONS.

2. THE NECESSARY CALCULATIONS TO VERIFY THAT NO COMPONENT OF THE BRIDGE WILL BE OVERSTRESSED DURING THE PROPOSED USE OF THE EQUIPMENT ON THE BRIDGE. THE CALCULATIONS SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER CURRENTLY LICENSED TO PRACTICE ENGINEERING IN THE STATE OF IOWA.

When replacing prestressed concrete beams that have been damaged by high loads it has been office practice to include a plan note that prohibits placing heavy construction equipment on the deck during repair operations. Several contractors have requested exceptions to this restriction stating that they have the necessary equipment to do any removal and/or replacement from the deck, and by so doing cause less of an obstruction to traffic using the highway below. In Chapter 11 of the Construction Manual the Office of

Construction recently defined loads that require review and approval, and thus there will be reason in addition to this plan note for the contractor to submit deck loading plans.

The office has no objection to the placing of construction equipment on the bridge deck providing the traffic requirements across the bridge can still be satisfied and that no portions of the structure are overstressed during repair operations.

Therefore, on plans involving the replacement of damaged prestressed concrete beams this note should be included.

E450/M450: Approach pavement, new PCC

THE CONTRACTOR SHALL CONSTRUCT NEW BRIDGE APPROACH PAVEMENT AS NOTED AND SHOWN. THE PRICE BID FOR "BRIDGE APPROACH SECTION, REINFORCED AS PER PLAN" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING P.C. CONCRETE APPROACH PAVEMENT, INCLUDING EXCAVATION REINFORCING STEEL AND JOINT MATERIAL REQUIRED.

This note should be used for approach slab repair (non-standard) situations where a portion of the approach slab is replaced or where special details or reinforcing is required in the approach slab and shown on the plans.

E451/M451: Approach pavement, PCC overlay

THE CONTRACTOR SHALL PLACE PORTLAND CEMENT CONCRETE OVERLAY ON THE BRIDGE APPROACH PAVEMENT AS NOTED AND SHOWN ON STANDARD ROAD PLAN RK-17. PAYMENT FOR THIS WORK SHALL BE NOTED ON STANDARD ROAD PLAN RK-17.

Include this note only when the overlay quantity for the approaches is part of the bridge quantities.

E461/M461: Backwall repair, Class C concrete

THE TOPS OF THE ABUTMENT BACKWALLS AS SHOWN SHALL BE CONSTRUCTED USING STRUCTURAL CONCRETE CLASS C. PROMPTLY AFTER THE CONCRETE HAS BEEN PLACED AND VIBRATED AS PROVIDED IN ARTICLES 2403.03, C, AND 2403.03, D, OF THE STANDARD SPECIFICATIONS, IT SHALL BE HAND FINISHED TO PROVIDE A SMOOTH SURFACE WITH THE PROPER CROWN. THE CONTRACTOR MAY ELECT TO USE FORMWORK WHICH IS MARKED OR TRIMMED TO THE CORRECT ELEVATION AND CROWN TO PROVIDE THE LIMITS FOR THE HAND FINISHING.

This note is used when a portion of or the entire backwall is being reconstructed.

Generally the top of the abutment backwall is 1.00 foot (300 mm) or less in width, depending on the type of expansion joint. This is too narrow an area to realistically use any type of vibrator screed. Typically the tops of abutment backwalls are surveyed and closely graded on the formwork. The concrete finishing is performed by vibrating the concrete with stinger vibrators, and then the concrete surface is hand float finished. The contractor would not be able to use either a finishing machine or a vibratory screed and achieve as good a grade and finish as they can by closely grading the formwork and hand float finishing.

E462/M462: Backwall repair, earth support, stage construction

IT WILL BE NECESSARY TO SUPPORT THE EARTH AND/OR GRANULAR MATERIAL BEHIND THE ABUTMENT DURING RECONSTRUCTION OF THE ABUTMENT BACKWALLS BY SOME METHOD APPROVED BY THE ENGINEER. ALL COSTS FOR SUPPORTING THE EARTH AND/OR GRANULAR MATERIAL SHALL BE INCLUDED IN THE PRICE BID FOR "CLASS 20 EXCAVATION".

This note is used when a backwall is being reconstructed under stage construction.

E463/M463: Concrete sealer, barrier rail

THE TOP AND INTERIOR FACES OF THE EXISTING CONCRETE RAILING ARE TO BE CLEANED AND SEALED IN ACCORDANCE WITH ARTICLE 2403.03, P, OF THE STANDARD SPECIFICATIONS. IF NEW SECTIONS OF RAIL ARE CONSTRUCTED, THE NEW SECTIONS SHALL NOT BE SEALED. ALL COSTS ASSOCIATED WITH CLEANING AND SEALING OF THE CONCRETE RAILS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM " ?? ".

If repair work is being done on a bridge, the field has requested that we apply concrete sealer to the traffic face and top of the existing concrete barrier rails. This should apply when overlays are being applied or when rail end sections are being updated on the structures. Do not seal rails unless other repairs require traffic control for both sides of the bridge.

New concrete barrier rails shall not be sealed. There is concern that the sealant prevents proper curing of the concrete and therefore should not be applied to new concrete surfaces.

The cost of the sealing should be made incidental to a contract item. Examples of bid items in which it could be included are: “Concrete Repair”, “Repair Beam Ends”, “Deck Overlay” or “Structural Concrete”.

One issue to consider before adding the sealing work to the plans is the condition of the existing barrier rail. If the barrier has severe deterioration, consider whether repairs need to be made first before sealing, or if the sealing is worth the cost.

E470: Paint, raise plate on expansion device

SURFACES OF EXISTING EXPANSION DEVICE ARE TO BE CLEANED OF EXISTING CORROSION AND PAINT IN PREPARATION FOR FIELD WELDING. THE 1 1/2 " THICK RAISE PLATES FOR THE EXPANSION DEVICE ARE TO BE CLEANED AND PAINTED AFTER FIELD WELDING TO THE EXISTING EXPANSION DEVICE. THE CLEANING IS TO BE BY VACUUM BLAST OR BY A NON-BLASTING METHOD AND IS TO COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL SPECIFICATIONS SSPC-SP3. THE EXPOSED TOP SURFACES OF THE COMPLETED EXPANSION DEVICE ARE TO BE GIVEN ONE COAT OF BOTH A RUST INHIBITOR TYPE PRIMER AND FINAL COAT AS APPROVED BY THE ENGINEER. THE COLOR OF THE DRY PAINT SHOULD APPROXIMATE THE COLOR OF CONCRETE. ONLY THE EXPOSED SURFACES OF THE EXPANSION DEVICE AND RAISE PLATES ARE TO BE PAINTED. NO PAINTING OF OTHER STEEL IS REQUIRED. BECAUSE OF THE SMALL QUANTITY, ALL COST ASSOCIATED WITH CLEANING AND PAINTING OF THE EXPANSION DEVICE AS NOTED IS TO BE INCLUDED IN THE BID ITEM "PAINTING STRUCTURAL STEEL".

THE BID ITEM "STRUCTURAL STEEL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING RAISE PLATES ON EXPANSION DEVICE AS SHOWN EXCEPT ITEMS INCLUDED IN THE BID ITEM " PAINTING STRUCTURAL STEEL" AND THE BID ITEM "CONTAINMENT".

Coating is to be specified in generic terms. Expand the definition of structural steel when appropriate. Use containment note and scrape test note. See the cleaning and painting article in the bridge design manual [BDM 9.1.9.5.2].

M470: Paint, raise plate on expansion device

SURFACES OF EXISTING EXPANSION DEVICE ARE TO BE CLEANED OF EXISTING CORROSION AND PAINT IN PREPARATION FOR FIELD WELDING. THE 40 mm THICK RAISE PLATES FOR THE EXPANSION DEVICE ARE TO BE CLEANED AND PAINTED AFTER

FIELD WELDING TO THE EXISTING EXPANSION DEVICE. THE CLEANING IS TO BE BY VACUUM BLAST OR BY A NON-BLASTING METHOD AND IS TO COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL SPECIFICATIONS SSPC-SP3. THE EXPOSED TOP SURFACES OF THE COMPLETED EXPANSION DEVICE ARE TO BE GIVEN ONE COAT OF BOTH A RUST INHIBITOR TYPE PRIMER AND FINAL COAT AS APPROVED BY THE ENGINEER. THE COLOR OF THE DRY PAINT SHOULD APPROXIMATE THE COLOR OF CONCRETE. ONLY THE EXPOSED SURFACES OF THE EXPANSION DEVICE AND RAISE PLATES ARE TO BE PAINTED. NO PAINTING OF OTHER STEEL IS REQUIRED. BECAUSE OF THE SMALL QUANTITY, ALL COST ASSOCIATED WITH CLEANING AND PAINTING OF THE EXPANSION DEVICE AS NOTED IS TO BE INCLUDED IN THE BID ITEM "PAINTING STRUCTURAL STEEL".

THE BID ITEM "STRUCTURAL STEEL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING RAISE PLATES ON EXPANSION DEVICE AS SHOWN EXCEPT ITEMS INCLUDED IN THE BID ITEM " PAINTING STRUCTURAL STEEL" AND THE BID ITEM "CONTAINMENT".

Coating is to be specified in generic terms. Expand the definition of structural steel when appropriate. Use containment note and scrape test note. See the cleaning and painting article in the bridge design manual [BDM 9.1.9.5.2].

E471/M471: Paint, strip seal on sliding plate

SURFACES OF EXISTING EXPANSION DEVICE AS DETAILED IN THESE PLANS ARE TO BE CLEANED OF EXISTING CORROSION AND PAINT IN PREPARATION FOR FIELD WELDING. THE NEW STEEL EXTRUSION TO BE PAINTED SHALL BE CLEANED AND PAINTED AFTER FIELD WELDING TO THE EXISTING EXPANSION DEVICE. THE CLEANING IS TO BE BY VACUUM BLAST OR BY A NON-BLASTING METHOD AND IS TO COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL SPECIFICATIONS SSPC-SP3. THE EXPOSED SURFACES OF THE COMPLETED EXPANSION DEVICE ARE TO BE GIVEN ONE COAT OF BOTH A RUST INHIBITOR TYPE PRIMER AND FINAL COAT AS APPROVED BY THE ENGINEER. THE COLOR OF THE DRY PAINT SHOULD APPROXIMATE THE COLOR OF CONCRETE. ONLY THOSE SURFACES OF THE EXPANSION DEVICE NOTED TO BE PAINTED ARE TO BE PAINTED. NO PAINTING OF OTHER STRUCTURAL STEEL IS REQUIRED. BECAUSE OF THE SMALL QUANTITY, ALL COST ASSOCIATED WITH CLEANING AND PAINTING OF THE EXPANSION DEVICE AS NOTED IS TO BE INCLUDED IN THE BID ITEM "PAINTING STRUCTURAL STEEL".

THE BID ITEM "STEEL EXTRUSION JOINT WITH NEOPRENE" SHALL INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING THE EXPANSION DEVICE AS SHOWN, EXCEPT ITEMS INCLUDED IN THE BID ITEM "PAINTING STRUCTURAL STEEL" AND THE BID ITEM "CONTAINMENT".

Coating is to be specified in generic terms. Use this note when a strip seal is to be installed on a sliding plate expansion device. The plans should show what is to be painted. Use containment note and scrape test note.
See the cleaning and painting article in the bridge design manual [BDM 9.1.9.5.2].

E472A/M472A: Paint, minor part repainting, steel bridge

THE LUMP SUM BID FOR " PAINTING STRUCTURAL STEEL" SHALL INCLUDE THE COST OF PREPARING ALL THE EXISTING STRUCTURAL STEEL FOR PAINTING (INCLUDING BEARINGS) AND FIELD PAINTING EXISTING STRUCTURAL STEEL AS NOTED IN THESE PLANS. CLEANING AND PAINTING SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS.

Use this note for repainting of minor parts (bearings, expansion devices, etc.) of steel bridges. Repainting is normally a separate contract. Use containment note and scrape

test note. The bid items “Bridge Cleaning for Painting” and “Blast Cleaning of Structural Steel” shall not be used, but considered incidental and included in “Painting of Structural Steel”.

E472B/M472B: Paint, complete repainting, steel bridge

THE LUMP SUM BID FOR “BRIDGE CLEANING FOR PAINTING” SHALL INCLUDE THE COSTS OF REMOVAL OF ACCUMULATED FOREIGN MATERIAL, LOOSE PAINT AND WATER WASHING IN ACCORDANCE WITH~~AS DESCRIBED IN~~ SECTION 2508, OF THE STANDARD SPECIFICATIONS.

THE LUMP SUM BID FOR “BLAST CLEANING OF STRUCTURAL STEEL” SHALL INCLUDE ALL COSTS FOR THE PREPARATION OF STEEL SURFACES THAT REQUIRE PAINTING IN ACCORDANCE WITH~~AS DESCRIBED IN~~ SECTION 2508, OF THE STANDARD SPECIFICATIONS.

THE LUMP SUM BID FOR “PAINTING OF STRUCTURAL STEEL” SHALL INCLUDE ALL COSTS FOR PAINTING THE STRUCTURAL STEEL IN ACCORDANCE WITH~~AS DESCRIBED IN~~ SECTION 2508, OF THE STANDARD SPECIFICATIONS. AN EPOXY PAINT SYSTEM SHALL BE USED. BEFORE CLEANING THE EXISTING STRUCTURAL STEEL, THE BRIDGE CONTRACTOR SHALL REMOVE ANY ATTACHMENTS NOT BEING REUSED. IN ADDITION, ANY EXISTING STEEL INACCESSABLE AFTER REASSEMBLY WILL BE GIVEN THE FULL PAINT SYSTEM BEFORE FINAL ASSEMBLY OF THE STRUCTURE.

Use this note for steel bridges that are being remodeled, where complete repainting is required. Use containment note and scrape test note.

E472C/M472C: Paint, strengthening angles, steel bridge

THE LUMP SUM BID ITEMS FOR “BRIDGE CLEANING FOR PAINTING”, “BLAST CLEANING OF STRUCTURAL STEEL” AND “PAINTING OF STRUCTURAL STEEL” SHALL INCLUDE THE COSTS OF CLEANING, BLAST CLEANING AND FIELD PAINTING OF THE EXISTING STRUCTURAL STEEL AREA WHERE THE STRENGTHENING ANGLES WILL BE INSTALLED. THE BID ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. THE PAINT SYSTEM REQUIRED IS DESCRIBED IN THE “BEAM STRENGTHENING NOTES” IN THESE PLANS.

Bid items for “Bridge Cleaning for Painting”, “Blast Cleaning of Structural Steel” and “Painting of Structural Steel” and "Containment" shall be included on the plan in accordance with Article 2508.01, A, Non-Hazardous Paint Removal, of the Standard Specifications.

Place "Beam Strengthening Notes" E1000 (M1000) on the detail sheet, which shows the strengthening angles.

E473/M473: Paint, bearing repainting, concrete bridge

ABUTMENT BEARINGS (SOLE PLATES AND MASONRY PLATES) ARE TO BE CLEANED AND PAINTED. CLEANING BY VACUUM BLASTING OR BY A NON-BLASTING METHOD IS REQUIRED. SURFACE TO BE PAINTED SHALL BE PREPARED IN ACCORDANCE WITH STEEL STRUCTURES PAINTING COUNCIL (SSPC) SP3. SURFACES OF THE ABUTMENT BEARINGS ARE TO BE GIVEN ONE COAT OF BOTH A RUST INHIBITOR TYPE PRIMER AND FINAL COAT AS APPROVED BY THE ENGINEER. THE COLOR OF THE DRY PAINT SHOULD APPROXIMATE THE COLOR OF CONCRETE. THIS WORK SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER LUMP SUM FOR THE BID ITEM, "PAINTING OF STRUCTURAL STEEL".

Coating is to be specified in generic terms. This note is to be used on repair of a concrete beam bridge when bearings require painting. Check with the supervising Section Leader

or District personnel to see if this should be part of contract the or if the bridge crew can handle the work. Include containment note and scrape test note.

E474/M474: Paint, containment and disposal

CONTAINMENT AND DISPOSAL OF WASTE SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. ALL COSTS ASSOCIATED WITH HAULING AND DEPOSITING OF WASTE AT THE DESIGNATED SITE/FACILITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND INCLUDED IN THE CONTRACT PRICE BID FOR THE "CONTAINMENT" ITEM.

This note is to be used when removing paint from an existing structure. The scrape test results will be used to determine if the waste is considered hazardous or not. Different containment and disposal methods are specified for hazardous and nonhazardous paint. In addition, the bid item "Paint Waste Transport and Disposal" is required for hazardous waste.

E480/M480: Scrape test, lead and chromium ppm

A SCRAPE SAMPLE WAS TAKEN FROM AN AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL LEAD~~CHROMIUM~~ AND TOTAL CHROMIUM~~LEAD~~. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS ____ PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS ____ PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE ~~DEPARTMENT'S~~IOWA DOT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

Place this note on any plan requiring a paint scrape test. Scrape tests will be required in the following situations:

1. When a new bridge or culvert requires removal of an existing bridge that has painted structural steel. If the only steel on an existing bridge is expansion joint plate steel, a scrape test is not required.
2. On retrofit rail projects when the existing steel rail is to be removed.
3. On repair projects when cleaning and painting structural steel, including raise plates, bearings, and strengthening angles.
4. Bridge remodeling or widening where painting of or removal of the steel beams is involved.

The designer within the DOT should check to see if scrape tests have been performed on an existing bridge by checking the following Office of Location and Environment (OLE) database on the W-drive. If the bridge is not in the database, the designer should ask that the Assistant Bridge Engineer request a scrape test from OLE.

W:\Highway\EnvServices\RegulatedMaterials\Paint

Modify this note if a leachable amount of lead or chromium is provided with the scrape test results. In that case, place the leachable amount in parenthesis after the sample results as follows: (INCLUDES ___ PPM LEACHABLE).

If the leachable amount of lead or chromium is 5.0 PPM or greater the material is considered hazardous. If the lead or chromium is in excess of 35,000 PPM and a leachable amount is not available, it is assumed that the material is hazardous.

If the paint is removed from the steel by a cleaning process and there is a significant amount of paint waste (i.e. a widening or remodeling project involving complete repaint) and the paint is considered or assumed to be hazardous, the designer shall provide bid items to address handling of hazardous material.

Scrape tests are required for steel bridge removal, including steel rail retrofits. Designers need to inform the supervising Section Leader early in the design phase of any project requiring structural steel removal so that scrape tests can be received before job turn-in. The section leader will then notify the Assistant Bridge Engineer, who will order the scrape tests. Results of the test analyses will be returned to us to be included on the plans as noted.

If retrofit rail plans, including removal of steel handrails, are incorporated into road plans, place the scrape test note on the retrofit rail plan.

E481/M481: Scrape test, bridge demolition, hazardous levels of lead and chromium
THE CONTRACTOR SHALL CONDUCT THEIR OPERATIONS IN SUCH A MANNER THAT ANY PAINT REMOVED DURING DEMOLITION IS CONTAINED, COLLECTED, AND DISPOSED OF IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. BEFORE DELIVERY OF ANY SCRAP STEEL THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE TO THE RECEIVING FACILITY. THIS NOTICE SHALL AT A MINIMUM INCLUDE:

1. A NOTICE THAT THE SCRAP STEEL IS COATED WITH PAINT THAT HAS REGULATED MATERIALS AT LEVELS WHICH COULD BE HAZARDOUS TO EMPLOYEES OR THE ENVIRONMENT.

2. A COPY OF THE SCRAPE SAMPLE PROVIDED IN THE CONTRACT DOCUMENTS.

3. A SIGNATURE BLOCK FOR THE RECEIVING FACILITY TO CONFIRM THEIR RECEIPT OF THIS INFORMATION.

A COPY OF THIS NOTICE, SIGNED BY THE RECEIVING FACILITY, SHALL BE RETURNED TO THE ENGINEER BEFORE ANY SCRAP STEEL IS REMOVED FROM THE PROJECT.

This plan note should be used for bridge demolition projects that have hazardous levels of paint. This would include the minor projects where we remove painted railings, expansion devices, etc. as intact units. Hazardous levels are defined as levels of chromium or lead in the paint system at leachable levels of 5.0 PPM or greater determined by TCLP (leach test) or total levels greater than 35,000 PPM without a leachable amount determined by TCLP.

The designer within the DOT should check to see if scrape tests have been performed on an existing bridge by checking the following Office of Location and Environment (OLE) database on the W-drive. If the bridge is not in the database, the designer should ask that the Assistant Bridge Engineer request a scrape test from OLE.

W:\Highway\EnvServices\RegulatedMaterials\Paint

Add the following sentence to the end of the note when the Section 2508 paint waste transport and disposal bid item is not being used. Removal of intact masonry plates having potentially hazardous paint would be an example of a situation that requires the additional sentence.

THE COST OF HANDLING AND DISPOSAL OF ANY PAINTED STEEL OR REMOVED PAINT IS INCIDENTAL TO THE REMOVAL BID ITEM.

E490: Retrofit barrier rail, existing conduit

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING CONDUIT IN THE BRIDGE CURBS. IN ORDER TO ENSURE THE EXISTING CONDUITS ARE NOT DAMAGED DURING PLACEMENT OF THE CAST-IN-PLACE BARRIER RAIL, THE CONTRACTOR SHALL BE REQUIRED TO DO THE FOLLOWING:

1. PHYSICALLY LOCATE THE CONDUIT AT APPROXIMATELY 50 FOOT INTERVALS PRIOR TO DRILLING ANY HOLES FOR 3/4" DIAMETER DOWEL BARS.

2. AFTER COMPLETION OF DRILLING FOR THE 3/4" DOWEL BARS AND PRIOR TO PLACEMENT OF THE DOWELS, PROVE TO THE INSPECTOR BY A REASONABLE METHOD THE USABILITY OF THE CONDUIT HAS NOT BEEN COMPROMISED.

COST OF THESE OPERATIONS WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE CAST-IN-PLACE BARRIER RAIL. ANY DAMAGE TO THE CONDUIT OR WIRING BY THE CONTRACTOR WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.

> On some of the urban bridges where rail retrofits are to be installed, conduits for future electrification may have been placed in the existing curb. When conduits are in the curb, the barrier rail shall be widened from 10" to 1'-2 to attempt to miss the conduit. In addition, this note shall be placed on the plans.

M490: Retrofit barrier rail, existing conduit

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING CONDUIT IN THE BRIDGE CURBS. IN ORDER TO ENSURE THE EXISTING CONDUITS ARE NOT DAMAGED DURING PLACEMENT OF THE CAST-IN-PLACE BARRIER RAIL, THE CONTRACTOR SHALL BE REQUIRED TO DO THE FOLLOWING:

1. PHYSICALLY LOCATE THE CONDUIT AT APPROXIMATELY 15 METER INTERVALS PRIOR TO DRILLING ANY HOLES FOR 19 mm DIAMETER DOWEL BARS.

2. AFTER COMPLETION OF DRILLING FOR THE 19mm DOWEL BARS AND PRIOR TO PLACEMENT OF THE DOWELS, PROVE TO THE INSPECTOR BY A REASONABLE METHOD THE USABILITY OF THE CONDUIT HAS NOT BEEN COMPROMISED.

COST OF THESE OPERATIONS WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE CAST-IN-PLACE BARRIER RAIL. ANY DAMAGE TO THE CONDUIT OR WIRING BY THE CONTRACTOR WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.

> On some of the urban bridges where rail retrofits are to be installed, conduits for future electrification may have been placed in the existing curb. When conduits are in the curb, the barrier rail shall be widened from 250 mm to 350 mm to attempt to miss the conduit. In addition, this note shall be placed on the plans.

11.6 Future notes

11.6.1 Index

Reserved

11.6.2 Listing

Reserved

11.7 Culvert

These notes are placed on the general notes and quantities sheet.

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11.7.2 Listing

E600/M600: Design, intent, RCB culvert

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A ____ x ____ x ____ REINFORCED CONCRETE BOX CULVERT SKEWED ___° ___ AHEAD AT STATIONS ___+__.

Use this note on RCB culvert projects. Modify the description for tapered inlets, drop inlets, flume outlets, differently skewed headwalls, RCB extensions, structure replaced, etc.

E601A: Design, specification, 1983 AASHTO

THE R.C.B. CULVERT SECTIONS ARE DESIGNED FOR HS20-44 LIVE LOAD AND EARTH FILLS OF x FT. THIS DESIGN IS BASED ON LOAD FACTOR DESIGN, ACCORDING TO THE 1983 AASHTO SPECIFICATIONS, FOR VERTICAL LOADS THE WEIGHT OF EARTH IS ASSUMED AS 140 PCF AND FOR LATERAL EARTH LOADS EQUIVALENT FLUID PRESSURE IS ASSUMED AS 36 PSF/FT. Z = 170 k/in FOR CRACK CONTROL.

Loading given in this note is from 1983 AASHTO specifications and is applicable for culverts using the current English single and twin RCB standards. This note is not required on the plan if the RCB-G1-87 or TWRCB-G1-87 standard is referenced. Use the E601B note for RCB culverts designed using the program SIGLBOX or MULTIBOX.

E601B: Design, specification, 1992 AASHTO

THE R.C.B. CULVERT SECTIONS ARE DESIGNED FOR HS 20-44 LIVE LOAD AND EARTH FILLS OF x FEET. THIS DESIGN IS BASED ON LOAD FACTOR DESIGN, ACCORDING TO THE 1992 AASHTO SPECIFICATIONS, FOR VERTICAL LOADS THE WEIGHT OF EARTH IS ASSUMED AS 120·Fe PCF AND FOR LATERAL EARTH LOADS THE EQUIVALENT FLUID PRESSURE IS ASSUMED AS 30 PSF/FT. OR 60 PSF/FT. Z = 170 k/in FOR CRACK CONTROL.

Loading given in this note is from 1992 AASHTO specifications.

Use this note for non-standard English (The SIGLBOX or MULTIBOX program is used for lengths in excess of 25’ or box size not covered by standards.) or triple RCB English standards. Current triple RCB English standards are designed for this loading case, however single and twin RCB English standards are designed with 1983 AASHTO specifications. Additional work to update the standards to AASHTO LRFD will be addressed in the future.

M601B: Design, specification, 1992 AASHTO

THE R.C.B. CULVERT SECTIONS ARE DESIGNED FOR MS18 LIVE LOAD AND EARTH FILLS OF x mm. THIS DESIGN IS BASED ON LOAD FACTOR DESIGN, ACCORDING TO THE 1992 AASHTO SPECIFICATIONS, FOR VERTICAL LOADS THE WEIGHT OF EARTH IS ASSUMED AS 19·Fe kN/m³ AND FOR LATERAL EARTH LOADS THE EQUIVALENT FLUID PRESSURE IS ASSUMED AS 4.7 kPa/m OR 9.4 kPa/m. Z = 29.8 MN/m FOR CRACK CONTROL.

Loading given in this note is from 1992 AASHTO specifications.

Use this note for non-standard metric RCB (The SIGLBOX or MULTIBOX program is used for lengths in excess of 7.620 m or box size not covered by standards.) or metric RCB culvert plans. Current metric standards are designed for this loading case. Additional work to update the standards to AASHTO LRFD will be addressed in the future.

E602/M602: Existing structure, faint lines

FAINT LINES ON PLANS INDICATE EXISTING STRUCTURE.

E603A/M603A: Utility notification, urban

UTILITY COMPANIES AND MUNICIPALITIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

E603B/M603B: Utility notification, rural

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

E604/M604: Design, culvert standards

STANDARDS:

FOR DETAILS AND NOTES NOT SHOWN REFER TO THE FOLLOWING IOWA D.O.T. – CULVERT STANDARDS:

STANDARD	LATEST REVISION
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E606/M606: Headwall curtain walls, dewatering, alternate methods

WHEN DE-WATERING PRESENTS A PROBLEM FOR PLACING THE CURTAIN WALLS AS DETAILED, ALTERNATE METHODS SUCH AS STEEL SHEET PILE AND PRECAST CONCRETE WALLS MAY BE APPROVED BUT AT NO ADDITIONAL COST. THE CULVERT CONTRACTOR IS TO SUBMIT TO THE ENGINEER FOR APPROVAL COMPLETE DRAWINGS OF THE PROPOSED CURTAIN WALL ALTERNATE BEFORE BEGINNING CONSTRUCTION.

Place this note on all culvert plans that have headwall curtain walls. The criteria for approving a sheet pile alternate to the cast in place concrete curtain wall are as follows:

1. The top of the sheet piles is to extend a minimum of 6" (150 mm) into the concrete culvert floor.

2. The bottom of the sheet piles is to extend into the ground to an elevation at least 3' (900 mm) lower than the bottom elevation of the concrete curtain wall being replaced.

3. The steel sheet pile shall be a minimum thickness of 3/8" (9.5 mm).

E607/M607: Bell joints, upstream end

BELL JOINTS SHALL BE PLACED ON THE UPSTREAM END OF THE BARREL SECTIONS.

Use for all culverts that require bell joints.

M608: Metric project, dimensions

ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED OR SHOWN.

ALL ELEVATIONS ON THESE PLANS SHOWN IN METERS (m).

ALL STATIONS SHOWN IN METERS (m).

~~**E609A/M609A: Standards, single culvert**~~

~~THE LISTED CULVERT STANDARDS REFERRED TO ON THE TITLE SHEET ARE TO USE THE GENERAL NOTES, DESIGN STRESSES, AND THE SPECIFICATIONS SHOWN ON THE RCB-G1-87 STANDARD.~~

~~**E609B/M609B: Standards, twin culvert**~~

~~THE LISTED CULVERT STANDARDS REFERRED TO ON THE TITLE SHEET ARE TO USE THE GENERAL NOTES, DESIGN STRESSES, AND THE SPECIFICATIONS SHOWN ON THE TWRCB-G1-87 STANDARD.~~

~~**E609C/M609C: Standards, triple culvert**~~

~~THE LISTED CULVERT STANDARDS REFERRED TO ON THE TITLE SHEET ARE TO USE THE GENERAL NOTES, DESIGN STRESSES, AND THE SPECIFICATIONS SHOWN ON THE TRRCB-G1-01 STANDARD.~~

E610A/M610A: Traffic control plan, roadway open

THE ROADWAY WILL BE OPEN TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE.

E610B/M610B: Traffic control plan, roadway closed

THE ROADWAY WILL BE CLOSED TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE.

E611/M611: Traffic control plan, traffic maintained, flowable mortar

THIS CULVERT IS TO BE BUILT UNDER THE EXISTING xx WITH TRAFFIC MAINTAINED AT ALL TIMES. SEE DESIGN SHEETS IN THESE PLANS FOR ROAD WORK INCLUDED IN THIS PROJECT.

Use for flowable mortar backfill type projects. Give bridge size and type.

E620: Concrete, minimum clearances

REINFORCING BAR CLEARANCES WILL BE AS FOLLOWS:

EDGE CLEARANCES: 2" EXCEPT

TOP OF FLOOR	2 1/4 " TO NEAR TRANSV. REINF. BAR
BOTTOM OF FLOOR	3 1/2 " TO NEAR TRANSV. REINF.

BAR END CLEARANCES:

VERTICAL TOP	2"
VERTICAL BOTTOM	3 1/2 "
TRANSVERSE	2"

M620: Concrete minimum clearances

REINFORCING BAR CLEARANCES WILL BE AS FOLLOWS:

EDGE CLEARANCES: 50 mm EXCEPT

TOP OF FLOOR	60 mm TO NEAR TRANSV. REINF. BAR
BOTTOM OF FLOOR	90 mm TO NEAR TRANSV. REINF. BAR

END CLEARANCES:

VERTICAL TOP	50 mm
VERTICAL BOTTOM	90 mm

TRANSVERSE 50 mm

E621/M621: Concrete, floor barrel

FLOOR OF BARREL IS TO BE FINISHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

E622: Concrete, construction joints, keyway

ALL CONSTRUCTION JOINTS ARE TO BE FORMED WITH BEVELED 2 x 4 KEYWAYS, EXCEPT AT BELL JOINTS.

M622: Concrete, construction joints, keyway

ALL CONSTRUCTION JOINTS ARE TO BE FORMED WITH BEVELED 50 x 100 KEYWAYS, EXCEPT AT BELL JOINTS.

E623/M623: Concrete, construction joint, top of wall

THE PERMISSIBLE CONSTRUCTION JOINT AT THE TOP OF THE WALLS MAY BE LOWERED AT THE CONTRACTOR'S OPTION WITH ENGINEER'S APPROVAL.

E624/M624: Concrete, finishing, roadway surface

THE TOP SLAB SURFACE WILL BE FINISHED IN ACCORDANCE WITH ARTICLE 2301.03. MACROTEXTURE SHALL BE APPLIED LONGITUDINALLY (PARALLEL TO CENTERLINE OF THE ROADWAY). MACROTEXTURE SHALL BE PLACED ON THE ENTIRE TOP SURFACE OF THE TOP SLAB EXCEPT IN THE AREA WITHIN APPROXIMATELY 2 FEET OF THE PARAPET.

Use note E/M 624 to allow longitudinal tining by hand when traffic will ride on the top slab of the culvert. For metric projects substitute “600 MM” for “2 FEET”.

E625/M625: Paving notch, protection

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE CULVERT SLAB OR CULVERT WALLS FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE CULVERT CONTRACTOR AT NO EXTRA COST TO THE STATE.

When traffic will ride on the top slab of the culvert, provide this note for paving notch protection.

E630: Reinforcing, construction joint, no bell joints

EXCEPT FOR DOWEL BARS 5r1, LONGITUDINAL REINFORCING IS NOT TO EXTEND THRU THE CONSTRUCTION JOINTS.

Use this note only if bell joints are not required.

M630: Reinforcing, construction joint, no bell joints

EXCEPT FOR DOWEL BARS r1, SIZE 15, LONGITUDINAL REINFORCING IS NOT TO EXTEND THRU THE CONSTRUCTION JOINTS.

Use this note only if bell joints are not required.

E631: Reinforcing, support intervals

ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED AT INTERVALS OF NOT MORE THAN 3'-O IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

M631: Reinforcing, support intervals

ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED AT INTERVALS OF NOT MORE THAN 900 mm IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

E632A: Reinforcing, splice, bar spacing 6 inches or more

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE NUMBER	4	5	6	7	8
MINIMUM SPLICE LENGTH	17"	21"	25"	34"	44"

THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.

Use this note when vertical wall bars are spaced at 6" or greater intervals. Do not allow this splice if culvert height is 5' or less.

M632A: Reinforcing, splice, bar spacing 150 mm or more

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE NUMBER	10	15	20	25
MINIMUM SPLICE LENGTH	360	510	640	1060

THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.

Use this note when vertical wall bars are spaced at 150 mm or greater intervals. Do not allow this splice if culvert height is 1.5 m or less.

E632B: Reinforcing, splice, bar spacing less than 6 inches

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE NUMBER	4	5	6	7	8
MINIMUM SPLICE LENGTH	21"	26"	31"	43"	55"

THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.

Use this note when vertical wall bars are spaced at less than 6" intervals. Do not allow this splice if culvert height is 5' or less.

M632B: Reinforcing, splice, bar spacing less than 150 mm

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE NUMBER	10	15	20	25
MINIMUM SPLICE LENGTH	450	640	790	1320

THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.

Use this note when vertical wall bars are spaced at less than 150 mm intervals. Do not allow this splice if culvert height is 1.5 m or less.

E633: Reinforcing, concrete pipe or CMP openings

A ?" DIAMETER RF-1 PIPE (OR CMP) IS TO BE CAST IN THE WALL (OR SLAB) AT THE LOCATION INDICATED. THE CONTRACTOR IS TO FURNISH A 4 FOOT SECTION OF PIPE. THE PIPE IS TO BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR STRUCTURAL CONCRETE. THE LONGITUDINAL AND TRANSVERSE BARS, IN THE AREA OF THE OPENING, ARE TO BE FIELD CUT AND BENT TO PROVIDE FOR 2" MINIMUM CLEARANCE ALL AROUND THE OPENING.

An estimate reference information note for the “Structural Concrete” bid item needs to be included. This note will indicate the pipe size and length and make the furnishing and placing incidental to the cost of the “Structural Concrete”.

M633: Reinforcing, concrete pipe or CMP openings

A ? mm DIAMETER RF-1 PIPE (OR CMP) IS TO BE PROVIDED IN THE WALL (OR SLAB) AT THE LOCATION INDICATED. THE CONTRACTOR IS TO FURNISH A 1220 mm SECTION OF PIPE. THE PIPE IS TO BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR STRUCTURAL CONCRETE. THE LONGITUDINAL AND TRANSVERSE BARS, IN THE AREA OF THE OPENING, ARE TO BE FIELD CUT AND BENT TO PROVIDE FOR 50 mm MINIMUM CLEARANCE ALL AROUND THE OPENING.

An estimate reference information note for the “Structural Concrete” bid item needs to be included. This note will indicate the pipe size and length and make the furnishing and placing incidental to the cost of the “Structural Concrete”.

E634/M634: Paving notch, dowels

PAVING NOTCH DOWELS SHALL BE STAINLESS STEEL DEFORMED BAR GRADE 60, MEETING THE REQUIREMENTS OF MATERIALS I.M. 452. THE WEIGHT OF THE STAINLESS STEEL PAVING NOTCH DOWEL BAR IS TO BE INCLUDED WITH THE WEIGHT OF THE EPOXY COATED REINFORCING STEEL. ADDITIONAL COST IS TO BE INCLUDED IN THE PRICE BID FOR "REINFORCING STEEL - EPOXY COATED".

When traffic will ride on the top slab of the culvert the approach slab shall be tied to the paving notch with stainless steel dowels. Use E634/M 634 to specify the stainless steel material.

E640/M640: Stage construction, typical method

NEW CULVERT CONSTRUCTION SHALL BE DONE IN STAGES AS SPECIFIED ON THE STAGE CONSTRUCTION LAYOUTS. ONE LANE OF TWO-WAY TRAFFIC IS TO BE MAINTAINED ON THE EXISTING ROADWAY DURING STAGE I AND ON A TEMPORARY RUNAROUND DURING STAGE II.

This is the typical method for staging RCB culvert construction.

E650: Removal, parapet, RCB extension

REMOVAL OF THE EXISTING CULVERT SHALL BE ON A VERTICAL PLANE PARALLEL WITH AND AT THE FRONT FACE OF THE EXISTING PARAPET, AND TO THE WIDTH OF THE FLOOR OF THE PROPOSED EXTENSION. THE REMOVAL LINE SHALL BE INITIATED WITH A 2 1/2 "± DEEP SAW CUT ON THE TOP AND BOTH SIDES OF EACH WALL, AND ACROSS THE TOP OF THE FLOOR. THIS SAW CUT SHOULD CUT THRU ANY EXISTING LONGITUDINAL REINFORCING THEREBY FACILITATING A NEAT NON-SPALLED BREAK LINE, IF EXISTING TOP OF PARAPETS WILL BE WITHIN 0'-6 OF PROPOSED SUBGRADE ELEVATION, THE PARAPETS SHALL BE REMOVED DOWN TO AN ELEVATION 1"± ABOVE THE TOP OF THE EXISTING SLAB. ANY EXISTING PARAPET VERTICAL BARS EXPOSED DURING PARAPET REMOVAL SHALL BE CUT OFF FLUSH WITH THE PARAPET REMOVAL LINE AND PAINTED WITH TWO COATS OF ZINC RICH PAINT.

Use this note for RCB culvert extension projects.

M650: Removal, parapet, RCB extension

REMOVAL OF THE EXISTING CULVERT SHALL BE ON A VERTICAL PLANE PARALLEL WITH AND AT THE FRONT FACE OF THE EXISTING PARAPET, AND TO THE WIDTH OF THE FLOOR OF THE PROPOSED EXTENSION. THE REMOVAL LINE SHALL BE INITIATED WITH A 65 mm± DEEP SAW CUT ON THE TOP AND BOTH SIDES OF EACH WALL, AND ACROSS THE TOP OF THE FLOOR. THIS SAW CUT SHOULD CUT THRU ANY EXISTING LONGITUDINAL REINFORCING THEREBY FACILITATING A NEAT NON-SPALLED BREAK LINE, IF EXISTING TOP OF PARAPETS WILL BE WITHIN 150 mm OF PROPOSED SUBGRADE ELEVATION, THE PARAPETS SHALL BE REMOVED DOWN TO AN ELEVATION

25 mm± ABOVE THE TOP OF THE EXISTING SLAB. ANY EXISTING PARAPET VERTICAL BARS EXPOSED DURING PARAPET REMOVAL SHALL BE CUT OFF FLUSH WITH THE PARAPET REMOVAL LINE AND PAINTED WITH TWO COATS OF ZINC RICH PAINT.

Use this note for RCB culvert extension projects.

E651/M651: Removal, entire structure

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS.

E660/M660: Excavation, by others

ANY CHANNEL EXCAVATION BEYOND THE INLET OR OUTLET ENDS OF THE CULVERT IS TO BE DONE BY OTHERS AND IS NOT A PART OF THIS CONTRACT.

On projects where road and bridge plans are combined, do not reference work shown in the plans to be done "by others". On combined plans there are no "others".

E661/M661: Excavation, excess Class 20

EXCESS CLASS 20 EXCAVATION MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED AT THE CONSTRUCTION SITE, AS DIRECTED BY THE ENGINEER.

Notify the road design section how much excess excavation is available, and determine if the excess excavation is needed for backfilling or other roadwork.

If the material is suitable and can be used by another contractor at the site, include this note in the plan; otherwise the contractor must dispose of the material in accordance with the Standard Specifications [IDOT SS 2402.03, G]. This note is typically used when backfilling is done using flowable mortar.

E662: Excavation, rock encountered

IT IS ANTICIPATED THAT ROCK MAY BE ENCOUNTERED WHEN CONSTRUCTING THIS BOX CULVERT. IF IT IS ENCOUNTERED IN THE AREA OF THE FLOOR OF THE CULVERT, THE ROCK IS TO BE REMOVED AT LEAST TO THE BOTTOM OF THE FLOOR OF THE CULVERT. IF IT IS ENCOUNTERED IN THE AREA OF THE APRON CURTAIN WALLS, THE CURTAIN WALL IS TO EXTEND INTO THE ROCK A MINIMUM OF 6". SEE DETAILS IN THESE PLANS.

This note is to be used if Class 23 excavation is bid for earth removal.

The culvert design should be investigated to determine if the rock at the bottom of floor elevation creates a worse condition than the design assumptions made by the culvert design program. If stress conditions are worse, over excavation to 1' below the bottom of floor and backfilling with granular backfill should be considered.

M662: Excavation, rock encountered

IT IS ANTICIPATED THAT ROCK MAY BE ENCOUNTERED WHEN CONSTRUCTING THIS BOX CULVERT. IF IT IS ENCOUNTERED IN THE AREA OF THE FLOOR OF THE CULVERT, THE ROCK IS TO BE REMOVED AT LEAST TO THE BOTTOM OF THE FLOOR OF THE CULVERT. IF IT IS ENCOUNTERED IN THE AREA OF THE APRON CURTAIN WALLS, THE CURTAIN WALL IS TO EXTEND INTO THE ROCK A MINIMUM OF 150 mm. SEE DETAILS IN THESE PLANS.

This note is to be used if Class 23 excavation is bid for earth removal.

The culvert design should be investigated to determine if the rock at the bottom of floor elevation creates a worse condition than the design assumptions made by the culvert

design program. If stress conditions are worse, over excavation to 300 mm below the bottom of floor and backfilling with granular backfill should be considered.

E663/M663: Excavation, Class 20 assumption

THE CLASS 20 EXCAVATION QUANTITY IS BASED ON THE ASSUMPTION THAT AT THE START OF CULVERT CONSTRUCTION, THE EXISTING GROUNDLINE SHOWN ON THE "SITUATION PLAN" ON DESIGN HAS REMAINED UNDISTURBED AND NO ROADWAY FILL HAS BEEN PLACED.

Use this note on all plans that will have roadway fill placed as part of another contract.

E670/M670: Temporary shoring, culvert extensions

SINCE THE HIGHWAY WILL NOT BE CLOSED TO TRAFFIC DURING THIS CONSTRUCTION, THE CONTRACTOR MAY FEEL TEMPORARY SHORING (SHEET PILE OR OTHER) IS NECESSARY TO ENSURE THAT THE SHOULDER WILL NOT SLOUGH IN WHILE CULVERT IS BEING EXTENDED. HOWEVER, IF FOR ANY REASON SUCH SHORING IS DEEMED) NECESSARY, THE CULVERT CONTRACTOR SHALL SUBMIT A SHORING PLAN TO THE ENGINEER FOR APPROVAL. COST OF SHORING, IF REQUIRED, WILL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO DIRECT PAYMENT WILL BE MADE. THEREFORE, ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.

Use this note for culvert extensions.

E680/M680: Backfill, flowable mortar

THE CULVERT SHALL BE BACKFILLED WITH FLOWABLE MORTAR. FOR FLOWABLE MORTAR DETAILS AND OTHER ROAD WORK SEE ROAD SHEETS IN THESE PLANS.

Check with the Office of Design to determine if flowable mortar is to be used as backfill.

E690: Precast, headwall and box option

THE CULVERT CONTRACTOR MAY USE PRECAST BOX SECTIONS AND PRECAST HEADWALLS INSTEAD OF THE CAST IN PLACE SECTIONS AND HEADWALLS SHOWN ON THE PLANS. BEFORE BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED PRECAST BOX SECTIONS AND HEADWALLS TO THE ENGINEER FOR APPROVAL. THE DETAILS SHALL INCLUDE THE FOLLOWING:

A. THE HEADWALL SHALL INCLUDE A PARAPET AT LEAST 1'-0 WIDE EXTENDING A MINIMUM OF 1'-O ABOVE TOP OF SLAB.

B. HEADWALL WINGS MAY BE PARALLEL RATHER THAN FLARED. THE TOP OF WINGWALL BEGINS AT THE TOP OF PARAPET AND SLOPES DOWNWARD TO THE END OF APRON. AT THE END OF APRON THE TOP OF WINGWALL IS TO BE TWO FEET ABOVE FLOW LINE ELEVATION. FOR O° SKEW CULVERTS THE SLOPE OF WINGWALL SHALL BE THREE HORIZONTAL TO ONE VERTICAL.

C. THE CURTAIN WALL SHALL BE THE SAME WIDTH AND EXTEND THE SAME DISTANCE BELOW FLOW LINE AS THE CURTAIN WALL FOR THE CAST IN PLACE BOX SHOWN ON THE PLANS.

D. WHEN PARALLEL WINGWALLS ARE USED, THE CLEAR SPAN DISTANCE OF THE PRECAST BOX SHALL BE INCREASED TO ONE FOOT GREATER THAN THE SPAN OF THE CAST IN PLACE BOX SHOWN ON THE PLANS.

E. WHEN THE CULVERT IS CONSTRUCTED ON A SKEW TO THE CENTERLINE OF ROADWAY, THE BACK TO BACK OF PARAPET DIMENSION SHALL BE LENGTHENED. THE DISTANCE BETWEEN THE PARAPET CORNERS CLOSEST TO THE CENTERLINE OF ROADWAY SHALL EQUAL OR EXCEED THE BACK TO BACK OF PARAPET DIMENSION SHOWN ON THE PLANS. THE WINGWALLS OF SKEWED CULVERTS SHALL EXTEND TO A POINT WHERE THE END OF APRON CLOSEST TO THE CENTERLINE OF ROADWAY COINCIDES WITH A POINT TWO FEET ABOVE THE TOE OF THREE HORIZONTAL AND ONE VERTICAL FORESLOPE.

THE CONTRACTOR SHALL ALLOW TEN WORKING DAYS FOR THE ENGINEER'S REVIEW. FOR CONSTRUCTING THE PRECAST ALTERNATE THE CONTRACTOR WILL BE PAID THE UNIT BID PRICES FOR THE PLAN QUANTITIES OF STRUCTURAL CONCRETE AND REINFORCING STEEL.

The Specification Committee removed the option of using precast box culverts in 1995. (Reference Specification Committee minutes dated May 11, 1995.) The contractor may submit a value engineering proposal. Do not use this note unless specifically directed to do so. This note and M690 do not meet current office policy and remain in the listing for history only.

On Primary and Interstate system projects, the use of precast barrel sections and precast headwalls for box culverts may be allowed provided the following criteria are met:

1. Only on new single box culverts

2. The fill height must be greater than 2 ft and less than 20 ft.

3. The expected settlement must be less than 0.5 feet.

M690: Precast, headwall and box option

THE CULVERT CONTRACTOR MAY USE PRECAST BOX SECTIONS AND PRECAST HEADWALLS INSTEAD OF THE CAST IN PLACE SECTIONS AND HEADWALLS SHOWN ON THE PLANS. BEFORE BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED PRECAST BOX SECTIONS AND HEADWALLS TO THE ENGINEER FOR APPROVAL. THE DETAILS SHALL INCLUDE THE FOLLOWING:

A. THE HEADWALL SHALL INCLUDE A PARAPET AT LEAST 305 mm WIDE EXTENDING A MINIMUM OF 305 mm ABOVE TOP OF SLAB.

B. HEADWALL WINGS MAY BE PARALLEL RATHER THAN FLARED. THE TOP OF WINGWALL BEGINS AT THE TOP OF PARAPET AND SLOPES DOWNWARD TO THE END OF APRON. AT THE END OF APRON THE TOP OF WINGWALL IS TO BE 610 mm ABOVE FLOW LINE ELEVATION. FOR O° SKEW CULVERTS THE SLOPE OF WINGWALL SHALL BE THREE HORIZONTAL TO ONE VERTICAL.

C. THE CURTAIN WALL SHALL BE THE SAME WIDTH AND EXTEND THE SAME DISTANCE BELOW FLOW LINE AS THE CURTAIN WALL FOR THE CAST IN PLACE BOX SHOWN ON THE PLANS.

D. WHEN PARALLEL WINGWALLS ARE USED, THE CLEAR SPAN DISTANCE OF THE PRECAST BOX SHALL BE INCREASED TO 305 mm GREATER THAN THE SPAN OF THE CAST IN PLACE BOX SHOWN ON THE PLANS. WHEN THE CULVERT IS CONSTRUCTED ON A SKEW TO THE CENTERLINE OF ROADWAY, THE BACK TO BACK OF PARAPET DIMENSION SHALL BE LENGTHENED. THE DISTANCE BETWEEN THE PARAPET CORNERS CLOSEST TO THE CENTERLINE OF ROADWAY SHALL EQUAL OR EXCEED THE BACK TO BACK OF PARAPET DIMENSION SHOWN ON THE

PLANS. THE WINGWALLS OF SKEWED CULVERTS SHALL EXTEND TO A POINT WHERE THE END OF APRON CLOSEST TO THE CENTERLINE OF ROADWAY COINCIDES WITH A POINT 610 mm ABOVE THE TOE OF THREE HORIZONTAL AND ONE VERTICAL FORESLOPE.

THE CONTRACTOR SHALL ALLOW TEN WORKING DAYS FOR THE ENGINEER'S REVIEW. FOR CONSTRUCTING THE PRECAST ALTERNATE THE CONTRACTOR WILL BE PAID THE UNIT BID PRICES FOR THE PLAN QUANTITIES OF STRUCTURAL CONCRETE AND REINFORCING STEEL.

The Specification Committee removed the option of using precast box culverts in 1995. (Reference Specification Committee minutes dated May 11, 1995.) The contractor may submit a value engineering proposal. Do not use this note unless specifically directed to do so. This note and E690 do not meet current office policy and remain in the listing for history only.

On Primary and Interstate system projects, the use of precast barrel sections and precast headwalls for box culverts may be allowed provided the following criteria are met:

1. Only on new single box culverts

2. The fill height must be greater than 600 mm and less than 6000 mm.

3. The expected settlement must be less than 150 mm.

11.8 Bridge substructure

These notes are placed on the pier details sheets and on the abutment details sheets.

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11.8.2 Listing

E700: Pier concrete, minimum clearance

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

M700: Pier concrete, minimum clearance

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.

E701: Pier concrete, construction joints, keyways

CONSTRUCTION JOINTS ARE TO BE FORMED WITH A 3 x 10 x * DRESSED AND BEVELED STRIP.

This note is to be used to key the columns of a T-pier to the cap and footing. Use a series of short keys 3 x 12 x 1'0 spaced at 2'-0 on skews of 30° or more in lieu of 3 x 10 keyway.

Length dimension shall be 5' less than out to out of shaft.

M701: Pier concrete, construction joints, keyways

CONSTRUCTION JOINTS ARE TO BE FORMED WITH A 75 x 250 x * DRESSED AND BEVELED STRIP.

This note is to be used to key the columns of a T-pier to the cap and footing. Use a series of short keys 75 x 300 x 300 mm spaced at 600 mm on skews of 30° or more in lieu of 75 x 250 keyway.

Length dimension shall be 1520 mm less than out to out of shaft.

E710/M710: Pier reinforcing, bar shift at anchor bolts

REINFORCING BARS MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.

To be used when anchor bolts for bearings are to be preset in pier cap. Refer to notes E730 and M730.

E711: Pier reinforcing, column spiral

SPIRAL REINFORCING IS TO BE NO. 4 BAR WITH XXXX" DIAMETER, 12" PITCH WITH 4 EQUALLY SPACED L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 1/2 EXTRA TURNS AT TOP AND BOTTOM COLUMNS.

THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 2'-2. THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR OTHER REINFORCEMENT.

Use this note only with a 12" pitch spiral.

M711: Pier reinforcing, column spiral

SPIRAL REINFORCING IS TO BE NO. 10 BAR WITH XXXX mm DIAMETER, 300 mm PITCH WITH 4 EQUALLY SPACED L 22 x 22 x 3 SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 1/2 EXTRA TURNS AT TOP AND BOTTOM COLUMNS.

THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 660 mm. THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR OTHER REINFORCEMENT.

Use this note only with a 300 mm pitch spiral.

E712: Pier reinforcing, column tie option

COLUMN TIES SPACED AT 12" CENTERS MAY BE SUBSTITUTED FOR THE SPIRAL REINFORCEMENT. PAYMENT WILL BE BASED ON THE WEIGHT OF SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY WEIGHT WILL BE ALLOWED. SEE BENT BAR DETAILS FOR SPLICE LAP LENGTH.

Use this note for columns with spirals with a 12" pitch. See the column detailing article [BDM 6.6.4.1.2.2].

M712: Pier reinforcing, column tie option

COLUMN TIES SPACED AT 300 mm CENTERS MAY BE SUBSTITUTED FOR THE SPIRAL REINFORCEMENT. PAYMENT WILL BE BASED ON THE MASS OF SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY QUANTITY WILL BE ALLOWED. SEE BENT BAR DETAILS FOR SPLICE LAP LENGTH.

Use this note for columns with spirals with a 300 mm pitch. See the column detailing article [BDM 6.6.4.1.2.2].

E714/M714: Pier reinforcing. Column tie option, not permissible

SUBSTITUTION OF COLUMN TIES (HOOPS) IS NOT PERMITTED.

Use this note for spirally designed columns with spirals at 3" (75 mm) pitch. Substitution of column ties would result in an unconservative design.

E715/M715: Pier columns, construction joint

PERMISSIBLE CONSTRUCTION JOINTS MAY BE USED TO PLACE CONCRETE FOR THE PIER COLUMNS IN TWO STAGES. THE PERMISSIBLE CONSTRUCTION JOINTS, IF USED, SHALL BE PLACED MIDWAY BETWEEN THE e1 COLUMN HOOP BARS ANYWHERE IN THE COLUMN. d1 VERTICAL COLUMN BARS MAY BE SPLICED WITH ONE LAP AT THE

PERMISSIBLE CONSTRUCTION JOINT. THE MINIMUM LENGTH OF THE LAP SPLICE SHALL BE ?? . PAYMENT FOR d1 REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.

Use this note only if pier height exceeds 40 feet (12.190 m).

E718: Pier piles, LRFD contract length and resistance

THE CONTRACT LENGTH OF ___ FEET FOR THE PIER ___ PILES IS BASED ON A ___ SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF ___ KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF ___ FOR SOIL AND ___ FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF ___ KIPS. PIER PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF ___ KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A ___ SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF ___ FOR SOIL AND ___ FOR ROCK END BEARING. DESIGN SCOUR WAS ASSUMED TO AFFECT THE UPPER ___ FEET OF EMBEDDED PILE LENGTH AND CAUSE ___ KIPS OF DRIVING RESISTANCE.

1. Fill in the contract length (ft).
2. Fill in pier number (1, 2…) or delete the blank if the note covers all piers.
3. Fill in soil classification for design (cohesive, mixed, or non-cohesive).
4. Fill in the total factored axial load per pile (P_u, kips).
5. Fill in the resistance factor (phi) for design in soil. If piles are to be driven to rock, add the resistance factor (phi) for rock; otherwise, delete the end of the sentence beginning with “for”. If piles are designed for rock bearing alone, delete ___ FOR SOIL AND.
6. If piles are subject to downdrag, fill in the factored downdrag load (P_u, kips).
7. If piles were designed for tension, fill in the factored tension force; otherwise delete the sentence.
8. Fill in soil classification for construction control (cohesive, mixed, or non-cohesive).
9. Fill in the resistance factor for construction control (phi).
10. If piles were designed for scour, fill in the affected embedded length (ft); otherwise, delete the sentence.
11. Revise this note for special conditions not covered above.

E719: Pier piles, LRFD driving and construction control

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER ___ PILES IS ___ TONS AT END OF DRIVE. IF RETAPS ARE NECESSARY THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS ___ TONS AT ONE-DAY RETAP, ___ TONS AT THREE-DAY RETAP, OR ___ TONS AT SEVEN-DAY RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN ___ FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

1. Fill in pier number (1, 2…) or delete the blank if the note covers all piers.
2. Fill in end of drive bearing (tons).
3. For cohesive sites with consideration of setup, fill in applicable retap blanks. If only one-day retap is different, delete three-day and seven day-retap parts of the sentence. For cohesionless or mixed sites, piles driven to rock, or other cases with no difference in EOD and retap value, delete the retap sentence and add OR RETAP to the end of the first sentence.
4. If retap is specifically required for construction control, substitute the following sentence.

- PILES SHALL BE RETAPPED AT ___ DAYS WITH A REQUIRED NOMINAL AXIAL BEARING RESISTANCE OF ___ TONS.

5. For timber piles replace the contract length sentence with the following:
   - THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH A DRIVING LIMIT OF 160 TONS.
6. If piles are subject to tension, scour, or other conditions requiring a minimum embedment length, fill in the length; otherwise delete the sentence.
7. Replace the construction control sentence if a method other than WEAP without planned retap is to be used. Alternate sentences are as follows:
   - CONSTRUCTION CONTROL REQUIRES AN IOWA DOT ENR FORMULA.
   - CONSTRUCTION CONTROL REQUIRES PDA/CAPWAP AND A WEAP ANALYSIS WITH BEARING GRAPH.
   - CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH AND A RETAP AT ___ DAYS AFTER EOD.
8. Revise this note for special conditions not covered above.

E720: Pier piles, design bearing

THE DESIGN BEARING FOR THE PIER PILES IS X TONS.

Indicate the actual design bearing. This could be less than the maximum allowable design bearing. Pile lengths are to be based on the actual design bearing.

M720: Pier piles, design bearing

THE DESIGN BEARING FOR THE PIER PILES IS X kN.

Indicate the actual design bearing. This could be less than the maximum allowable design bearing. Pile lengths are to be based on the actual design bearing.

E721A: Pier spread footings, bearing, hard rock

THE DESIGN BEARING PRESSURE FOR THE FOOTINGS ON _____ IS _____ TONS PER SQ.FT. FOOTINGS TO EXTEND AT LEAST 12" INTO _____ WITH THE FINAL 12" OF EXCAVATION TO BE TO NEAT LINES OF THE FOOTING.

Use this note for hard rock installation, limestone or cemented sandstone. Use the actual name of rock given in soundings. Consult with the Soils Design Section for allowable bearing value.

M721A: Pier spread footings, bearing, hard rock

THE DESIGN BEARING PRESSURE FOR THE FOOTINGS ON _____ IS _____ kN/m². FOOTINGS TO EXTEND AT LEAST 300 mm INTO _____ WITH THE FINAL 300 mm OF EXCAVATION TO BE TO NEAT LINES OF THE FOOTING.

Use this note for hard rock installation, limestone or cemented sandstone. Use the actual name of rock given in soundings. Consult with the Soils Design Section for allowable bearing value.

E721B: Pier spread footings, bearing, soft rock

THE DESIGN BEARING PRESSURE FOR THE FOOTINGS ON _____ IS __ TONS PER SQ.FT. FOOTINGS TO EXTEND AT LEAST 18" INTO _____ WITH THE FINAL 12" OF EXCAVATION TO NEAT LINES OF THE FOOTING.

This note is to be used for soft rock such as uncemented sandstone or siltstone. Consult with the Soils Design Section for allowable bearing value.

M721B: Pier spread footings, bearing, soft rock

THE DESIGN BEARING PRESSURE FOR THE FOOTINGS ON _____ IS __ kN/m². FOOTINGS TO EXTEND AT LEAST 450 mm INTO _____ WITH THE FINAL 300 mm OF EXCAVATION TO NEAT LINES OF THE FOOTING.

This note is to be used for soft rock such as uncemented sandstone or siltstone. Consult with the Soils Design Section for allowable bearing value.

E721C: Pier spread footings, shale

FOOTINGS ARE TO EXTEND AT LEAST 18" INTO SOUND SHALE WITH THE FINAL 12" OF EXCAVATION TO BE TO NEAT LINES OF THE FOOTING. FOOTING CONCRETE IS TO BE PLACED NOT LATER THAN THE DAY FOLLOWING EXCAVATION OF ANY PORTION OF THE FOOTING AREA TO FINAL ELEVATION. THE FOUNDATION SHALL BE KEPT DRY DURING THE PERIOD BETWEEN FINAL EXCAVATION AND PLACING OF THE FOOTING CONCRETE.

The time limit for exposure of shale is used due to deterioration of shale when exposed to air.

M721C: Pier spread footings, shale

FOOTINGS ARE TO EXTEND AT LEAST 450 mm INTO SOUND SHALE WITH THE FINAL 300 mm OF EXCAVATION TO BE TO NEAT LINES OF THE FOOTING. FOOTING CONCRETE IS TO BE PLACED NOT LATER THAN THE DAY FOLLOWING EXCAVATION OF ANY PORTION OF THE FOOTING AREA TO FINAL ELEVATION. THE FOUNDATION SHALL BE KEPT DRY DURING THE PERIOD BETWEEN FINAL EXCAVATION AND PLACING OF THE FOOTING CONCRETE.

The time limit for exposure of shale is used due to deterioration of shale when exposed to air.

E722/M722: Pier piles, H-pile points

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE PIERS.

Pile points are used to penetrate boulders or to anchor piles into steeply inclined bedrock. If pile points are used, the recommendations should come from the Soils Design Section.

E723: Pier piles, encasement, pile bents

THE PIER PILE ENCASEMENTS ARE TO BE AS DETAILED AND NOTED ON IOWA D.0.T. STANDARD ____, AS SHOWN IN THESE PLANS. THE UNIT PRICE BID FOR ENCASEMENT SHALL BE FULL PAYMENT FOR FURNISHING AND PLACING ALL MATERIAL AND NECESSARY EXCAVATION. THE PILING ENCASEMENTS ARE TO EXTEND FROM THE BOTTOM OF PIER CAP TO ELEVATION SHOWN.

Use this note for individual encasement [BDM 6.6.4.2.2] of steel H piles, and insert the appropriate standard, P10L or P10A.

M723: Pier piles, encasement, pile bents

THE PIER PILE ENCASEMENTS ARE TO BE AS DETAILED AND NOTED ON IOWA D.0.T. STANDARD MP1OA, AS SHOWN IN THESE PLANS. THE UNIT PRICE BID FOR ENCASEMENT SHALL BE FULL PAYMENT FOR FURNISHING AND PLACING ALL MATERIAL AND NECESSARY EXCAVATION. THE PILING ENCASEMENTS ARE TO EXTEND FROM THE BOTTOM OF PIER CAP TO ELEVATION SHOWN.

Use this note for individual encasement [BDM 6.6.4.2.2] of steel H piles.

E724/M724: Pier piles, battered pile cutoff

ALL BATTERED PILE SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN THE PLACEMENT OF REINFORCING.

Use this note when footing reinforcement is placed directly above battered H-piles, pipe piles, or timber piles in pier footings. Do not use this note for battered prestressed concrete piles.

E730: Pier anchor bolts, preset

ANCHOR BOLTS ARE TO BE PRESET IN PIERS IN ACCORDANCE WITH ARTICLE 2405.03, H, 2, OF THE STANDARD SPECIFICATIONS. THE WEIGHT OF ANCHOR BOLTS IS INCLUDED IN THE STRUCTURAL STEEL QUANTITY.

The preferred method of setting anchor bolts is in drilled holes in accordance with the Standard Specifications [IDOT SS 2405.03, H, 2]. Preset the anchor bolts and include this note only if drilling is not desirable, such as very tight rebar spacing in the pier cap. Do not preset anchor bolts in two adjacent piers unless provisions are made for construction inaccuracies and adjustments.

M730: Pier anchor bolts, preset

ANCHOR BOLTS ARE TO BE PRESET IN PIERS IN ACCORDANCE WITH ARTICLE 2405.03, H, 2, OF THE STANDARD SPECIFICATIONS. THE MASS OF ANCHOR BOLTS IS INCLUDED IN THE STRUCTURAL STEEL QUANTITY.

The preferred method of setting anchor bolts is in drilled holes in accordance with the Standard Specifications [IDOT SS 2405.03, H, 2]. Preset the anchor bolts and include this note only if drilling is not desirable, such as very tight rebar spacing in the pier cap. Do not preset anchor bolts in two adjacent piers unless provisions are made for construction inaccuracies and adjustments.

E740/M740: Drilled shafts, rock socket grooving not required

DRILLED SHAFT ROCK SOCKETS SHALL BE BRUSHED BUT SHALL NOT BE GROOVED.

Use this note for sockets in hard rock, as determined by the Soils Design Section. See also BDM C6.3.4.

E800: Abutment concrete, minimum clearance

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

M800: Abutment concrete, minimum clearance

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.

E801/M801: Abutment concrete, mask wall, stub

THE MASKWALL IS TO BE POURED BEFORE THE SUPERSTRUCTURE SLAB IS POURED.

Use this note for stub abutments.

E802: Abutment concrete, construction joints, keyways

CONSTRUCTION JOINT KEYWAYS ARE TO BE FORMED WITH BEVELED 2 x 8's, EXCEPT AS NOTED.

Keyways shall preferably be indicated in details and not in notes.

M802: Abutment concrete, construction joints, keyways

CONSTRUCTION JOINT KEYWAYS ARE TO BE FORMED WITH BEVELED 50 x 200's, EXCEPT AS NOTED.

Keyways shall preferably be indicated in details and not in notes.

E803/M803: Abutment concrete, expansion device, stub

THE PORTION OF THE BACKWALL CONTAINING THE ABUTMENT ANCHORAGE OF THE EXPANSION DEVICE IS TO BE PLACED AFTER THE BRIDGE DECK IS PLACED.

Use this note for stub abutments. The construction sequence allows for proper setting of the expansion joint.

E818: Abutment piles, LRFD contract length and resistance

THE CONTRACT LENGTH OF ___ FEET FOR THE ___ ABUTMENT PILES IS BASED ON A ___ SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF ___ KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF ___ FOR SOIL AND ___ FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF ___ KIPS. ABUTMENT PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF ___ KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A ___ SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF ___ FOR SOIL AND ___ FOR ROCK END BEARING. DESIGN SCOUR (100-YEAR) WAS ASSUMED TO AFFECT THE UPPER ___ FEET OF EMBEDDED PILE LENGTH AND CAUSE ___ KIPS OF DRIVING RESISTANCE.

1. Fill in the contract length (ft).
2. Fill in abutment location (north, east, south, or west) or delete the blank if the note covers both abutments.
3. Fill in soil classification for design (cohesive, mixed, or non-cohesive).
4. Fill in the total factored axial load per pile (P_u, kips).
5. Fill in the resistance factor (phi) for design in soil. If piles are to be driven to rock, add the resistance factor (phi) for rock; otherwise, delete the end of the sentence beginning with “FOR”. If piles are designed for rock bearing alone, delete ___ FOR SOIL AND.
6. If piles are subject to downdrag, fill in the factored downdrag load (P_u, kips).
7. If piles were designed for tension, fill in the factored tension force; otherwise delete the sentence.
8. Fill in soil classification for construction control (cohesive, mixed, or non-cohesive).
9. Fill in the resistance factor for construction control (phi).
10. If piles were designed for scour, fill in the affected embedded length (ft); otherwise, delete the sentence.
11. Revise this note for special conditions not covered above.

E819: Abutment piles, LRFD driving and construction control

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR ___ ABUTMENT PILES IS ___ TONS AT END OF DRIVE. IF RETAPS ARE NECESSARY TO ACHIEVE BEARING, THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS ___ TONS AT ONE-DAY RETAP, ___ TONS AT THREE-DAY RETAP, OR ___ TONS AT SEVEN-DAY RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN ___ FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

1. Fill in abutment location (north, east, south, or west) or delete the blank if the note covers both abutments.
2. Fill in end of drive bearing (tons).
3. For cohesive sites with consideration of setup, fill in applicable retap blanks. If only one-day retap is different, delete three-day and seven day-retap parts of the sentence. For cohesionless or mixed sites, piles driven to rock, or other cases with no difference in EOD and retap value, delete the retap sentence and add OR RETAP to the end of the first sentence.
4. If retap is specifically required for construction control, substitute the following sentence:
   - PILES SHALL BE RETAPPED AT ___ DAYS WITH A REQUIRED NOMINAL AXIAL BEARING RESISTANCE OF ___ TONS.
5. For timber piles, replace the contract length sentence with the following:
   - THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH A DRIVING LIMIT OF 160 TONS.
6. If piles are subject to tension, scour, or other condition requiring a minimum embedment length, fill in the length (ft); otherwise, delete the sentence.
7. Replace the construction control sentence if a method other than WEAP without planned retap is to be used. Alternate sentences are as follows:
   - CONSTRUCTION CONTROL REQUIRES AN IOWA DOT ENR FORMULA.
   - CONSTRUCTION CONTROL REQUIRES PDA/CAPWAP AND A WEAP ANALYSIS WITH BEARING GRAPH.
   - CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH AND A RETAP AT ___ DAYS AFTER EOD.
8. Revise this note for special conditions not covered above.

E820: Abutment piles, design bearing

THE DESIGN BEARING FOR THE ABUTMENT PILES IS X TONS.

Indicate the actual design bearing. This could be less than maximum allowable bearing capacity.

M820: Abutment piles, design bearing

THE DESIGN BEARING FOR THE ABUTMENT PILES IS X kN.

Indicate the actual design bearing. This could be less than maximum allowable bearing capacity.

E821M821: Abutment piles, H-pile points

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE ABUTMENTS.

Steel pile points are sometimes used to penetrate a layer of boulders or to anchor into steeply inclined bedrock. Pile points should not be indicated on the plans unless recommended by the Soils Design Section.

E830/M830: Abutment construction sequence, stub

BEAMS AND MASONRY PLATES ARE TO BE SET BEFORE BACKWALL IS PLACED.

Use this note for stub abutments.

E831A/M831A: Abutment subdrains, stub

THE COST OF PREFORMED EXPANSION JOINT FILLER, FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, AND COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE".

Use this note for stub abutments. See the Standard Specifications [IDOT SS 2403.05].

E831B/M831B: Abutment subdrains, integral and slab

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL AND POROUS BACKFILL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE".

Use this note for integral abutment and slabs.

E832: Excavate and dewater, pier footings

THE LUMP SUM BID ITEM, “EXCAVATE AND DEWATER” SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE EXCAVATION AND DEWATERING REQUIRED TO CONSTRUCT THE PIER FOOTINGS IN THE DRY, IN ACCORDANCE WITH SECTION 2405, OF THE STANDARD SPECIFICATIONS. THE LENGTH AND WIDTH OF THE SEAL COAT WAS BASED ON THE REQUIRED ONE FOOT CLEARANCE BETWEEN THE TIP OF THE SHEET PILES AND THE BATTERED PILING. THE CONCRETE SEAL COAT, IF USED, SHALL BE ?? FEET THICK, BASED ON A WATER ELEVATION OF ??. IF THE WATER ELEVATION IS HIGHER THAN ?? AT THE TIME OF CONSTRUCTION, A LARGER SEAL COAT MAY BE REQUIRED TO MAINTAIN THE CLEARANCE BETWEEN THE SHEET PILES AND BATTERED PILING. THE BRIDGE ENGINEER SHALL BE NOTIFIED BEFORE USING A LARGER SEAL COAT.

Use this note when the “Excavate and Dewater” bid item is used. See the seal coat article in the Bridge Design Manual for additional information [BDM 6.6.4.1.4].

M832: Excavate and dewater, pier footings

THE LUMP SUM BID ITEM, “EXCAVATE AND DEWATER” SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE EXCAVATION AND DEWATERING REQUIRED TO CONSTRUCT THE PIER FOOTINGS IN THE DRY, IN ACCORDANCE WITH SECTION 2405, OF THE STANDARD SPECIFICATIONS. THE LENGTH AND WIDTH OF THE SEAL COAT WAS BASED ON THE REQUIRED 300 mm CLEARANCE BETWEEN THE TIP OF THE SHEET PILES AND THE BATTERED PILING. THE CONCRETE SEAL COAT, IF USED, SHALL BE ?? METERS THICK, BASED ON A WATER ELEVATION OF ??. IF THE WATER ELEVATION IS HIGHER THAN ?? AT THE TIME OF CONSTRUCTION, A LARGER SEAL COAT MAY BE REQUIRED TO MAINTAIN THE CLEARANCE BETWEEN THE SHEET PILES AND BATTERED PILING. THE BRIDGE ENGINEER SHALL BE NOTIFIED BEFORE USING A LARGER SEAL COAT.

Use this note when the “Excavate and Dewater” bid item is used. See the seal coat article in the Bridge Design Manual for additional information [BDM 6.6.4.1.4].

E833: Pile downdrag, new earth fill

ABUTMENT (OR PIER) PILES ARE DESIGNED TO ACCOMMODATE DOWNDRAG FORCE DUE TO SOIL CONSOLIDATION UNDER THE NEW EARTH FILL. PILES SHALL BE DRIVEN TO ___ TONS BASED ON THEORETICAL DRIVING RESISTANCE. THIS INCLUDES ___ TONS OF RESISTANCE IN AND ABOVE THE COMPRESSIBLE LAYERS, ___ TONS RESISTANCE FOR DOWNDRAG FORCES AND ___ TONS RESISTANCE FOR DEAD AND LIVE LOAD BEARING CAPACITY.

See the downdrag article [BDM 6.2.2.3].

M833: Pile downdrag, new earth fill

ABUTMENT (OR PIER) PILES ARE DESIGNED TO ACCOMMODATE DOWNDRAG FORCE DUE TO SOIL CONSOLIDATION UNDER THE NEW EARTH FILL. PILES SHALL BE DRIVEN TO ___ kN BASED ON THEORETICAL DRIVING RESISTANCE. THIS INCLUDES ___ kN OF RESISTANCE IN AND ABOVE THE COMPRESSIBLE LAYERS, ___ kN RESISTANCE FOR DOWNDRAG FORCES AND ___ kN RESISTANCE FOR DEAD AND LIVE LOAD BEARING CAPACITY.

See the downdrag article [BDM 6.2.2.3].

E834: Pier piles, driving over waterways

PIER PILES ARE DESIGNED TO ACCOMMODATE THE ABSENCE OF SCOURABLE SOILS ABOVE THE 100 YEAR SCOUR ELEVATION SHOWN IN THESE PLANS. PILES SHALL BE DRIVEN TO ?? TONS BASED ON THEORETICAL DRIVING RESISTANCE. THIS INCLUDES ?? TONS OF RESISTANCE IN THE SCOURABLE LAYERS, AND ?? TONS RESISTANCE FOR DEAD AND LIVE LOAD BEARING CAPACITY.

When designing piers supporting bridges over waterways, current design practice is not to count skin friction through layers above the computed 100 year scour elevation, and to develop the required design bearing for the piles below this elevation. To clarify the intentions of our design for the field and to alleviate the need for the construction office to adjust the design bearing value given in our plans, we will now be including the driving resistance through the scourable soil layers on our plans in a fashion similar to the driving resistance listed for abutment piles with downdrag.

M834: Pier piles, driving over waterways

PIER PILES ARE DESIGNED TO ACCOMMODATE THE ABSENCE OF SCOURABLE SOILS ABOVE THE 100 YEAR SCOUR ELEVATION SHOWN IN THESE PLANS. PILES SHALL BE DRIVEN TO ?? kN BASED ON THEORETICAL DRIVING RESISTANCE. THIS INCLUDES ?? kN OF RESISTANCE IN THE SCOURABLE LAYERS, AND ?? kN RESISTANCE FOR DEAD AND LIVE LOAD BEARING CAPACITY.

See instructions for Note E834.

11.9 Bridge superstructure

These notes are placed on the superstructure details sheets.

11.9.1 Index

Anchor bolts
- Placement E924/M924

Empirical deck
- Concrete strength E920, M920
- Reinforcing placement E921, M921

Prestressed concrete beam bridge
- Deck placement E926/M926

Steel bridge
- Charpy V-notch E901/M901
- Field verify dimensions E900/M900
- Flange splice E904/M904
- Minimum temperature for field cutting, drilling, etc. E903, M903
- Shop drill option E902/M902
- Weathering steel E930, M930

11.9.2 Listing

E900/M900: Steel bridge, field verify dimensions

ALL DIMENSIONS AND DETAILS SHOWN IN THESE PLANS PERTINENT TO

FABRICATION OF STRUCTURAL STEEL SHALL BE VERIFIED IN THE FIELD BY THE BRIDGE CONTRACTOR BEFORE FABRICATION OF THE STRUCTURAL STEEL.

This note is to be used on all repair widening or remodeling projects requiring fabricating of structural steel.

E901/M901: Steel bridge, Charpy V-notch

CHARPY V-NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4152.02, OF THE STANDARD SPECIFICATIONS SHALL APPLY TO ALL CROSS FRAMES AND CONNECTION STIFFENERS AT CROSS FRAMES.

This note is to be used where steel girders are designed to be horizontally curved.

This requirement puts us in agreement with the AASHTO Standard Specifications [AASHTO-I 10.20.1], which states that cross frames for horizontally curved steel girder bridges shall be designed as main members.

E902/M902: Steel bridge, shop drill option

THE BRIDGE CONTRACTOR MAY SHOP DRILL ANY CONNECTION THAT IS SHOWN AS FIELD DRILLED IF PERTINENT DIMENSIONS ARE ACCURATELY FIELD MEASURED AND THE BRIDGE CONTRACTOR CAN ENSURE PROPER FIT BETWEEN NEW AND EXISTING STRUCTURAL STEEL.

E903: Steel bridge, minimum temperature for field cutting, drilling, etc.

NO TORCHWORK, CUTTING, GRINDING OR DRILLING OF HOLES ON THE EXISTING STRUCTURAL STEEL OF THE BRIDGE SHALL BE PERFORMED WHEN THE AIR TEMPERATURE AND STEEL TEMPERATURE ARE BELOW 40 °F.

On all repair work involving main members (as defined in the Standard Specifications [IDOT SS 4152.02]) include this note.

M903: Steel bridge, minimum temperature for field cutting, drilling, etc.

NO TORCHWORK, CUTTING, GRINDING OR DRILLING OF HOLES ON THE EXISTING STRUCTURAL STEEL OF THE BRIDGE SHALL BE PERFORMED WHEN THE AIR TEMPERATURE AND STEEL TEMPERATURE ARE BELOW 5 °C.

On all repair work involving main members (as defined in the Standard Specifications [IDOT SS 4152.02]) include this note.

E904/M904: Steel bridge, flange splice

THE FABRICATOR MAY REQUEST THE SUBSTITUTION OF A SINGLE PLATE OPTION FOR THE TOP AND BOTTOM FLANGE IN THE NEGATIVE REGION BETWEEN FIELD BOLTED SPLICE PLATES. THE REQUEST SHALL INCLUDE DESIGN CALCULATIONS SIGNED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF IOWA VERIFYING THE PLATE SIZE SUBSTITUTION AND BOLTED FIELD SPLICE ARE SATISFACTORY.

Provide this note on steel bridges where butt-welded shop splices are used in the negative regions to change flange plate sizes.

E920: Empirical deck, concrete strength

THE BRIDGE CONTRACTOR SHALL NOTE THE BRIDGE DECK SHALL BE CONCRETE WITH A MINIMUM 28 DAY STRENGTH OF 4000 PSI.

This note is to be used when the deck is designed using the LRFD empirical method. Design stresses on the front sheet of plans should indicate 4000 psi for deck concrete.

M920: Empirical deck, concrete strength

THE BRIDGE CONTRACTOR SHALL NOTE THE BRIDGE DECK SHALL BE CONCRETE WITH A MINIMUM 28 DAY STRENGTH OF 28 MPa.

This note is to be used when the deck is designed using the LRFD empirical method. Design stresses on the front sheet of plans should indicate 28 MPa for deck concrete.

E921: Empirical deck, reinforcing placement

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2 INCHES CLEAR BELOW THE TOP OF SLAB. TOP REINFORCING MAT IS TO BE TIED RIGIDLY WITH APPROVED TIES AT 100 PERCENT OF REINFORCING STEEL INTERSECTIONS. THE TOP MAT SHALL BE SUPPORTED BY INDIVIDUAL EPOXY COATED METAL BAR CHAIRS SPACED AT NO MORE THAN 2.0 FEET CENTERS LONGITUDINALLY AND TRANSVERSELY OR BY CONTINUOUS ROWS OF EPOXY COATED METAL BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED NOT MORE THAN 2.0 FEET APART.

BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1 INCH CLEAR ABOVE THE BOTTOM OF SLAB. BOTTOM REINFORCING MAT IS TO BE TIED RIGIDLY WITH APPROVED TIES AT ALTERNATE INTERSECTIONS SO THAT 50 PERCENT OF THE INTERSECTIONS ARE TIED. THE BOTTOM MAT SHALL BE SUPPORTED BY INDIVIDUAL EPOXY COATED METAL BAR CHAIRS SPACED AT NO MORE THAN 2.5 FEET CENTERS LONGITUDINALLY AND TRANSVERSELY OR BY CONTINUOUS ROWS OF EPOXY COATED METAL BAR CHAIRS OR SLAB BOLSTERS SPACED NOT MORE THAN 2.5 FEET APART.

This note is to be included for all LRFD empirical design bridge decks.

M921: Empirical deck, reinforcing placement

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 65 mm CLEAR BELOW THE TOP OF SLAB. TOP REINFORCING MAT IS TO BE TIED RIGIDLY WITH APPROVED TIES AT 100 PERCENT OF REINFORCING STEEL INTERSECTIONS. THE TOP MAT SHALL BE SUPPORTED BY INDIVIDUAL EPOXY COATED METAL BAR CHAIRS SPACED AT NO MORE THAN 600 mm CENTERS LONGITUDINALLY AND TRANSVERSELY OR BY CONTINUOUS ROWS OF EPOXY COATED METAL BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED NOT MORE THAN 600 mm APART.

BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 25 mm CLEAR ABOVE THE BOTTOM OF SLAB. BOTTOM REINFORCING MAT IS TO BE TIED RIGIDLY WITH APPROVED TIES AT ALTERNATE INTERSECTIONS SO THAT 50 PERCENT OF THE INTERSECTIONS ARE TIED. THE BOTTOM MAT SHALL BE SUPPORTED BY INDIVIDUAL EPOXY COATED METAL BAR CHAIRS SPACED AT NO MORE THAN 750 mm CENTERS LONGITUDINALLY AND TRANSVERSELY OR BY CONTINUOUS ROWS OF EPOXY COATED METAL BAR CHAIRS OR SLAB BOLSTERS SPACED NOT MORE THAN 750 mm APART.

This note is to be included for all LRFD empirical design bridge decks.

E924/M924: Anchor bolts, placement

WELDING OF ANCHOR BOLTS SHALL NOT BE ALLOWED. THE CONTRACTOR SHALL OBTAIN A TEMPLATE FROM THE MANUFACTURER / FABRICATOR FOR PROPER PLACEMENT OF THE ANCHOR BOLTS.

Welding of reinforcing bars to anchor bolts to maintain alignment of the bolts is of concern because the welding may alter material properties of the bolts, possibly causing brittle fractures.

E926/M926: Prestressed concrete beam bridge, deck placement

NOTE: CONCRETE DECK SLAB SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING SLAB CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS.

CADD standards 4514-4521 and 4549-4552 for prestressed beam bridges will be revised to delete the previous policy permitting continuous placement of lower volume decks given in deleted E925/M925, and to show only this note. H-series bridge standards will be updated as time permits.

E930: Steel bridge, weathering steel

ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. THE MINIMUM YIELD POINT FOR GRADE 50W STRUCTURAL STEEL IS 50 KSI~~,000 PSI~~ FOR PLATES 4 INCHES AND UNDER IN THICKNESS, AND ALL STRUCTURAL SHAPES. THE GRADE 50W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED.

DECK DRAINS INCLUDING PLATES WELDED TO THE DRAIN FOR DRAIN SUPPORT ARE TO BE GRADE 36 STEEL.

ALL PIECES COMPRISING THE [ABUTMENT AND] PIER BEARINGS SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES ON DESIGN SHEET/S ? & ?.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE FINISH ON DECK DRAINS, BEARINGS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND SECTION 2408, OF THE STANDARD SPECIFICATIONS. [ALL WEATHERING STEEL EMBEDDED INTO AN INTEGRAL ABUTMENT SHALL BE PAINTED TO A DISTANCE OF 1 FOOT FROM THE CONCRETE FACE AND SEALED BY CAULKING AT THE ABUTMENT CONCRETE AND STEEL INTERFACE.] EXTERIOR SURFACES OF ALL GALVANIZED COMPONENTS WHICH ARE DESIGNATED IN THE CONTRACT DOCUMENTS TO BE PAINTED SHALL BE PREPARED ACCORDING TO ARTICLE 2509.03, OF THE STANDARD SPECIFICATIONS.

~~THE GRADE 50W STEEL FOR THE WEBS OF THE EXTERIOR GIRDERS OF THE BRIDGE SHALL BE OF THE SAME TYPE AND FROM THE SAME STEEL MILL.~~

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

BOLTS USED TO SPLICE GIRDER SECTIONS ARE TO BE INSTALLED SUCH THAT NUTS ARE ON THE INSIDE FACE OF THE GIRDER WEBS FOR THE EXTERIOR GIRDERS, AND ON THE TOP OF BOTH TOP AND BOTTOM FLANGES OF ALL THE GIRDERS.

THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.

SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888 OR CSL342 JOINT SEALANT.

M930: Steel bridge, weathering steel

ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709M GRADE 345W. THE MINIMUM YIELD POINT FOR GRADE 345W STRUCTURAL STEEL IS 345 MPa FOR PLATES 100 mm AND UNDER IN THICKNESS, AND ALL STRUCTURAL SHAPES. THE GRADE 345W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED.

DECK DRAINS INCLUDING PLATES WELDED TO THE DRAIN FOR DRAIN SUPPORT ARE TO BE GRADE 250 STEEL.

ALL PIECES COMPRISING THE [ABUTMENT AND] PIER BEARINGS SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES ON DESIGN SHEET[S x &] x.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE FINISH ON DECK DRAINS, BEARINGS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND SECTION 2408, OF THE STANDARD SPECIFICATIONS. [ALL WEATHERING STEEL EMBEDDED INTO AN INTEGRAL ABUTMENT SHALL BE PAINTED TO A DISTANCE OF 300 mm FROM THE CONCRETE FACE AND SEALED BY CAULKING AT THE ABUTMENT CONCRETE AND STEEL INTERFACE.] EXTERIOR SURFACES OF ALL GALVANIZED COMPONENTS WHICH ARE DESIGNATED IN THE CONTRACT DOCUMENTS TO BE PAINTED SHALL BE PREPARED ACCORDING TO ARTICLE 2509.03, OF THE STANDARD SPECIFICATIONS.

~~THE GRADE 345W STEEL FOR THE WEBS OF THE EXTERIOR GIRDERS OF THE BRIDGE SHALL BE OF THE SAME TYPE AND FROM THE SAME STEEL MILL.~~

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

BOLTS USED TO SPLICE GIRDER SECTIONS ARE TO BE INSTALLED SUCH THAT NUTS ARE ON THE INSIDE FACE OF THE GIRDER WEBS FOR THE EXTERIOR GIRDERS, AND ON THE TOP OF BOTH TOP AND BOTTOM FLANGES OF ALL THE GIRDERS.

THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.

SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888 OR CSL342 JOINT SEALANT.

11.10 New and repair bridge detail

These notes are placed on the general notes sheet and on specific detail sheets.

11.10.1 Index

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11.10.2 Listing

E1000: Beam strengthening, angles

BEAM STRENGTHENING NOTES:

THE EXISTING _____ BEAMS TO BE STRENGTHENED WITH NEW STEEL __ x __ x __ STRENGTHENING ANGLES IN ACCORDANCE WITH THE FOLLOWING CONSTRUCTION SEQUENCE:

1.THE AREA OF THE EXISTING BEAMS WHICH WILL BE UNDER THE STRENGTHENING ANGLES AND AT LEAST ONE INCH OUTSIDE THE AREAS SHALL BE BLAST CLEANED TO A NEAR-WHITE CONDITION IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. VACUUM BLAST SHALL BE USED. IF THE CONTRACTOR RECYCLES THE BLAST MATERIAL, IN NO CASE SHALL THE RECYCLING PROCESS UTILIZE A WET SEPARATION METHOD. CONTAINMENT AND DISPOSAL OF WASTES SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS.

2. THE PORTION OF THE BLAST-CLEANED SURFACES WHICH WILL BE UNDER THE STRENGTHENING ANGLES AND AN ADDITIONAL ONE INCH OUTSIDE THESE AREAS SHALL BE GIVEN A PRIME COAT OF ZINC SILICATE PAINT IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. THE STRENGTHENING ANGLES SHALL RECEIVE THE ZINC SILICATE PRIMER ALSO. THE ZINC SILICATE PAINT SHALL MEET THE REQUIREMENTS OF MATERIALS IM. 482.02 APPENDIX A. CARE SHALL BE TAKEN TO INSURE THAT ZINC SILICATE PRIMER IS APPLIED ONLY ON BLAST-CLEANED STEEL SURFACES AND THAT NONE IS APPLIED OVER OLD PRIMER OR PAINT.

3. RESTRICT TRAFFIC TO ONE LANE OF TWO-WAY TRAFFIC ON THE SIDE OF THE BRIDGE AWAY FROM THE EXTERIOR BEAM BEING STRENGTHENED.

4. FIELD DRILL THE EXISTING I-BEAM WEB FOR 3/4 " DIA. H.S. BOLTS USING THE SHOP DRILLED HOLES IN THE STRENGTHENING ANGLES AS A TEMPLATE, EXCEPT AT DIAPHRAGM CONNECTIONS (NOTE AND DETAIL AS APPROPRIATE).

5. AFTER DRILLING, REMOVE STRENGTHENING ANGLES AND CLEAN ALL BURRS AND CUTTINGS FROM THE STRENGTHENING ANGLES AND BEAM MEMBERS.

6. BOLT THE _____ ANGLE TO THE I-BEAM WITH 3/4 " DIA. H.S. BOLT. FULLY TIGHTEN ALL BOLTS FOR A FRICTION TYPE CONNECTION. DURING THE TIGHTENING OF BOLTS, ALL POSSIBLE EFFORTS SHALL BE MADE BY THE CONTRACTOR TO MINIMIZE THE AMOUNT OF EQUIPMENT AND SUPPLIES STORED ON THE BRIDGE DECK AS DIRECTED BY THE ENGINEER. TRAFFIC MAY BE RESTORED AFTER ALL BOLTS ARE TIGHTENED.

7. PAINT THE BOLTS, NUTS, ANGLES, AND THE BLAST-CLEANED AREA AROUND IT IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS, AND WITH THE FOLLOWING ADDITIONS/EXCEPTIONS:

A. REMOVE ANY SILICATE PRIMER APPLIED (IN STEP 2 ABOVE) OVER OLD PRIMER OR PAINT.

B. APPLY EPOXY ALUMINUM PRIMER TO THE ATTACHED ANGLES AND AN ADDITIONAL 3 INCHES OUTSIDE THE ANGLES.

C. APPLY WATERBORNE ACRYLIC PAINT FINISH COAT OVER THE EPOXY ALUMINUM PRIMER. FINAL PAINT COAT SHALL MATCH THE COLOR OF THE EXISTING PAINT.

STRENGTHENING ANGLES SHOULD BE PLACED PRIOR TO PLACEMENT OF ANY OVERLAY OR CAST IN PLACE BARRIER RAIL.

ANY DAMAGE BY THE CONTRACTOR TO PORTIONS OF THE STRUCTURE AND ITS PAINT SYSTEM NOT SPECIFICALLY COVERED BY THE SCOPE OF THESE PLANS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

ALL NEW BOLTS ARE TO BE 3/4 " DIA. H.S. BOLTS AND ALL HOLES ARE TO BE 13/16 " DIA. BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. NO ADDITIONAL DEAD LOADS AND/OR CONSTRUCTION LOADS WILL BE ALLOWED ON THE BRIDGE WHILE BOLTS ARE BEING TORQUED TO SPECIFICATIONS.

THE PRICE BID FOR "STRUCTURAL STEEL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING STRENGTHENING ANGLES (INCLUDING FIELD DRILLING EXISTING BEAMS) AS NOTED ABOVE EXCEPT FOR ITEMS INCLUDED IN THE BID ITEMS FOR “BRIDGE CLEANING FOR PAINTING”, “BLAST CLEANING OF STRUCTURAL STEEL”, “CONTAINMENT AND PAINTING OF STRUCTURAL STEEL". CHARPY V NOTCH TESTING IS REQUIRED FOR THE STRENGTHENING ANGLES. ALSO SEE GENERAL NOTES FOR OTHER ITEMS INCLUDED IN STRUCTURAL STEEL.

This series of notes specifies surface preparation, paint application, and construction sequence for the installation of beam strengthening angles for a deck repair and overlay project. Place this series of notes with the details for the strengthening angles, not in the general notes. Modify notes as appropriate. Include notes for paint containment and disposal (E474/M474), painting strengthening angles (E472C/M472C), and scrape test (E480/M480) in general notes.

M1000: Beam strengthening, angles

BEAM STRENGTHENING NOTES:

THE EXISTING _____ BEAMS TO BE STRENGTHENED WITH NEW STEEL __ x __ x __ STRENGTHENING ANGLES IN ACCORDANCE WITH THE FOLLOWING CONSTRUCTION SEQUENCE:

1. THE AREA OF THE EXISTING BEAMS WHICH WILL BE UNDER THE STRENGTHENING ANGLES AND AT LEAST 25 mm OUTSIDE THE AREAS SHALL BE BLAST CLEANED TO A NEAR-WHITE CONDITION IN ACCORDANCE WITH SECTION 2508. VACUUM BLAST SHALL BE USED. IF THE CONTRACTOR RECYCLES THE BLAST MATERIAL, IN NO CASE SHALL THE RECYCLING PROCESS UTILIZE A WET SEPARATION METHOD. CONTAINMENT AND DISPOSAL OF WASTES SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS.

2. THE PORTION OF THE BLAST-CLEANED SURFACES WHICH WILL BE UNDER THE STRENGTHENING ANGLES AND AN ADDITIONAL 25 mm OUTSIDE THESE AREAS SHALL BE GIVEN A PRIME COAT OF ZINC SILICATE PAINT IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. THE STRENGTHENING ANGLES SHALL RECEIVE THE ZINC SILICATE PRIMER ALSO. THE ZINC SILICATE PAINT SHALL MEET THE REQUIREMENTS OF MATERIALS IM. 482.02 APPENDIX A. CARE SHALL BE TAKEN TO INSURE THAT ZINC SILICATE PRIMER IS APPLIED ONLY ON BLAST-CLEANED STEEL SURFACES AND THAT NONE IS APPLIED OVER OLD PRIMER OR PAINT.

3. RESTRICT TRAFFIC TO ONE LANE OF TWO-WAY TRAFFIC ON THE SIDE OF THE BRIDGE AWAY FROM THE EXTERIOR BEAM BEING STRENGTHENED.

4. FIELD DRILL THE EXISTING I-BEAM WEB FOR 19.0 mm DIA. H.S. BOLTS USING THE SHOP DRILLED HOLES IN THE STRENGTHENING ANGLES AS A TEMPLATE, EXCEPT AT DIAPHRAGM CONNECTIONS (NOTE AND DETAIL AS APPROPRIATE).

5. AFTER DRILLING, REMOVE STRENGTHENING ANGLES AND CLEAN ALL BURRS AND CUTTINGS FROM THE STRENGTHENING ANGLES AND BEAM MEMBERS.

6. BOLT THE _____ ANGLE TO THE I-BEAM WITH 19.0 mm DIA. H.S. BOLT. FULLY TIGHTEN ALL BOLTS FOR A FRICTION TYPE CONNECTION. DURING THE TIGHTENING OF BOLTS, ALL POSSIBLE EFFORTS SHALL BE MADE BY THE CONTRACTOR TO MINIMIZE THE AMOUNT OF EQUIPMENT AND SUPPLIES STORED ON THE BRIDGE DECK AS DIRECTED BY THE ENGINEER. TRAFFIC MAY BE RESTORED AFTER ALL BOLTS ARE TIGHTENED.

7. PAINT THE BOLTS, NUTS, ANGLES, AND THE BLAST-CLEANED AREA AROUND IT IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS.

A. REMOVE ANY SILICATE PRIMER APPLIED (IN STEP 2 ABOVE) OVER OLD PRIMER OR PAINT.

B. APPLY EPOXY ALUMINUM PRIMER TO THE ATTACHED ANGLES AND AN ADDITIONAL 75 mm OUTSIDE THE ANGLES.

C. APPLY WATERBORNE ACRYLIC PAINT FINISH COAT OVER THE EPOXY ALUMINUM PRIMER. FINAL PAINT COAT SHALL MATCH THE COLOR OF THE EXISTING PAINT.

STRENGTHENING ANGLES SHOULD BE PLACED PRIOR TO PLACEMENT OF ANY OVERLAY OR CAST IN PLACE BARRIER RAIL.

ANY DAMAGE BY THE CONTRACTOR TO PORTIONS OF THE STRUCTURE AND ITS PAINT SYSTEM NOT SPECIFICALLY COVERED BY THE SCOPE OF THESE PLANS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

ALL NEW BOLTS ARE TO BE 19.0 mm DIA. H.S. BOLTS AND ALL HOLES ARE TO BE 20.6 mm DIA. BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. NO ADDITIONAL DEAD LOADS AND/OR CONSTRUCTION LOADS WILL BE ALLOWED ON THE BRIDGE WHILE BOLTS ARE BEING TORQUED TO SPECIFICATIONS.

THE PRICE BID FOR "STRUCTURAL STEEL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING STRENGTHENING ANGLES (INCLUDING FIELD DRILLING EXISTING BEAMS) AS NOTED ABOVE EXCEPT FOR ITEMS INCLUDED IN THE BID ITEMS FOR “BRIDGE CLEANING FOR PAINTING”, “BLAST CLEANING OF STRUCTURAL STEEL”, “CONTAINMENT AND PAINTING OF STRUCTURAL STEEL". CHARPY V NOTCH TESTING IS REQUIRED FOR THE STRENGTHENING ANGLES. ALSO SEE GENERAL NOTES FOR OTHER ITEMS INCLUDED IN STRUCTURAL STEEL.

This series of notes specifies surface preparation, paint application, and construction sequence for the installation of beam strengthening angles for a deck repair and overlay project. Place this series of notes with the details for the strengthening angles; not in the general notes. Modify notes as appropriate. Include notes for paint containment and disposal (E474/M474), painting strengthening angles (E472C/M472C), and scrape test (E480/M480) in general notes.

E1001: Beam strengthening, shear studs

SHEAR STUDS WHICH ARE UNACCEPTABLE BY TESTING AFTER ATTACHMENT MAY BE REPAIRED BY ADDING A 5/16 " MINIMUM FILLET WELD IN PLACE OF THE MISSING WELD IN ACCORDANCE WITH OFFICE OF MATERIALS IM 558.

This note should be placed on the plans when old beams (pre-1940) are to be strengthened by adding shear studs.

M1001: Beam strengthening, shear studs

SHEAR STUDS WHICH ARE UNACCEPTABLE BY TESTING AFTER ATTACHMENT MAY BE REPAIRED BY ADDING AN 8 mm MINIMUM FILLET WELD IN PLACE OF THE MISSING WELD IN ACCORDANCE WITH OFFICE OF MATERIALS IM 558.

This note should be placed on the plans when old beams (pre-1940) are to be strengthened by adding shear studs.

E1005: Beam ends, sealing

THE PRICE BID ITEM “SEALER COAT-PRESTRESSED BEAM ENDS” SHALL INCLUDE ALL COSTS INCLUDING LABOR AND MATERIAL FOR PREPARING AND SEALING OF THE PRESTRESSED CONCRETE BEAM ENDS AT EACH EXPANSION JOINT LOCATION TO THE LIMITS SHOWN ON THESE PLANS. THE WORK SHALL BE PAID FOR PER “EACH” BEAM END THAT IS SEALED. SEALANT MATERIAL FOR THE BEAM ENDS SHALL BE FROM THE APPROVED MATERIAL LIST IM 491.19B. THE CONTRACTOR SHALL APPLY THE SEALANT IN ACCORDANCE WITH THE MANUFACTURER’S REQUIREMENTS.

E1010A/M1010A: Bearings, neoprene sheets

NEOPRENE SHEETS UNDER BEARINGS SHALL BE CONSIDERED INCIDENTAL TO THE STRUCTURAL STEEL BID ITEM.

E1010B/M1010B: Bearings, bronze plates and neoprene sheets

LUBRICATED BRONZE PLATES AND NEOPRENE SHEETS ARE A PART OF THE SUPERSTRUCTURE STEEL QUANTITY. UNIT PRICE BID FOR "STRUCTURAL STEEL" SHALL INCLUDE ALLOWANCE FOR COST OF BRONZE PLATES.

E1011: Bearings, curved sole plate, welding

AFTER WELDING THE CURVED PLATE TO THE 7 x 3/4 SOLE PLATE, THE WELD AND THE SURROUNDING AREA ARE TO BE CLEANED AND COATED IN ACCORDANCE WITH ASTM DESIGNATION A780-93a. USE "ZINC BASED SOLDERS" SPECIFIED UNDER PARAGRAPH 4.2.1 AND CLEAN AS SPECIFIED IN ANNEXES A1 OF THE SPECIFICATION.

This note is to be used on PPCB bridges when the bearing plate is more than one inch thick and requires a built up sole plate. Place this note adjacent to the detail showing the built up sole plate.

M1011: Bearings, curved sole plate, welding

AFTER WELDING THE CURVED PLATE TO THE 178 mm x 20 mm SOLE PLATE, THE WELD AND THE SURROUNDING AREA ARE TO BE CLEANED AND COATED IN ACCORDANCE WITH ASTM DESIGNATION A780-93a. USE "ZINC BASED SOLDERS" SPECIFIED UNDER PARAGRAPH 4.2.1 AND CLEAN AS SPECIFIED IN ANNEXES A1 OF THE SPECIFICATION.

This note is to be used on PPCB bridges when the bearing plate is more than 25 mm thick and requires a built up sole plate. Place this note adjacent to the detail showing the built up sole plate.

E1020: Reinforcing, mechanical splices, stage construction

THE ___ BARS IN THE ABUTMENT BACKWALLS SHALL BE SPLICED AT THE LOCATIONS SHOWN USING MECHANICAL SPLICE ASSEMBLIES. MECHANICAL SPLICE ASSEMBLIES CONSIST OF MECHANICAL SPLICERS AND REINFORCING SPLICE BARS AS REQUIRED TO FACILITATE THE USE OF THE MECHANICAL SPLICER. THE MECHANICAL SPLICE ASSEMBLY USED SHALL MEET THE REQUIREMENTS OF MATERIALS IM 451 APPENDIX E. REINFORCING SPLICE BARS SHALL BE A MINIMUM OF ____ INCH DIA.

ALL MECHANICAL SPLICE ASSEMBLIES TO BE USED IN SPLICING ___ BARS IN THE ABUTMENT BACKWALLS SHALL BE EPOXY COATED.

THE COST OF ALL SPLICE ASSEMBLIES IS TO BE INCLUDED IN THE PRICE BID FOR "REINFORCING STEEL EPOXY COATED" AND NO SEPARATE PAYMENT WILL BE MADE. THE WEIGHT OF MECHANICAL SPLICE ASSEMBLIES IS NOT INCLUDED IN THE QUANTITY SHOWN FOR "REINFORCING STEEL EPOXY COATED". A TOTAL OF x EPOXY COATED SPLICE ASSEMBLIES WILL BE REQUIRED.

This note is to be used in stage construction of the backwall where space is tight and bars in Stage I construction cannot extend past the construction joint and provide the required lap for Stage II construction. A note similar to this may be used whenever stage construction interferes with Stage I rebar placement (i.e. pier caps, abutment footing, bridge slab adjacent to sheet pile).

M1020: Reinforcing, mechanical splices, stage construction

THE ___ BARS IN THE ABUTMENT BACKWALLS SHALL BE SPLICED AT THE LOCATIONS SHOWN USING MECHANICAL SPLICE ASSEMBLIES. MECHANICAL SPLICE ASSEMBLIES CONSIST OF MECHANICAL SPLICERS AND REINFORCING SPLICE BARS AS REQUIRED TO FACILITATE THE USE OF THE MECHANICAL SPLICER. THE MECHANICAL SPLICE ASSEMBLY USED SHALL MEET THE REQUIREMENTS OF MATERIALS IM 451 APPENDIX E. REINFORCING SPLICE BARS SHALL BE A MINIMUM OF ____ mm DIA.

ALL MECHANICAL SPLICE ASSEMBLIES TO BE USED IN SPLICING ___ BARS IN THE ABUTMENT BACKWALLS SHALL BE EPOXY COATED.

THE COST OF ALL SPLICE ASSEMBLIES IS TO BE INCLUDED IN THE PRICE BID FOR "REINFORCING STEEL EPOXY COATED" AND NO SEPARATE PAYMENT WILL BE MADE. THE WEIGHT OF MECHANICAL SPLICE ASSEMBLIES IS NOT INCLUDED IN THE QUANTITY SHOWN FOR "REINFORCING STEEL EPOXY COATED". A TOTAL OF x EPOXY COATED SPLICE ASSEMBLIES WILL BE REQUIRED.

This note is to be used in stage construction of the backwall where space is tight and bars in Stage I construction cannot extend past the construction joint and provide the required lap for Stage II construction. A note similar to this may be used whenever stage construction interferes with Stage I rebar placement (i.e. pier caps, abutment footing, bridge slab adjacent to sheet pile).

E1025: Dowels, installation

THE _____ BARS SHALL BE SET AS DOWELS IN DRILLED HOLES. HOLES ARE TO BE 10" DEEP. THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. EITHER OF THE FOLLOWING SYSTEMS MAY BE USED AS A BONDING AGENT FOR VERTICAL DOWELS, BUT ONLY SYSTEM "A" MAY BE USED FOR HORIZONTAL DOWELS:

A. POLYMER GROUT SYSTEM IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS.

B. HYDRAULIC CEMENT GROUT SYSTEMS. DRILLED HOLES ARE TO BE 2 ½ TIMES THE DOWEL DIAMETER AND ARE TO BE BLOWN CLEAN WITH COMPRESSED AIR IMMEDIATELY PRIOR TO PLACING GROUT. THE HYDRAULIC CEMENT GROUT SHALL BE ONE OF THOSE APPROVED IN MATERIALS I.M. 491.13 AND SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

Indicate dowel setting procedure on the plans.

M1025: Dowels, installation

THE _____ BARS SHALL BE SET AS DOWELS IN DRILLED HOLES. HOLES ARE TO BE 255 mm DEEP. THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. EITHER OF THE FOLLOWING SYSTEMS MAY BE USED AS A BONDING AGENT FOR VERTICAL DOWELS, BUT ONLY SYSTEM "A" MAY BE USED FOR HORIZONTAL DOWELS:

A. POLYMER GROUT SYSTEM IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS.

B. HYDRAULIC CEMENT GROUT SYSTEMS. DRILLED HOLES ARE TO BE 2 1/2 TIMES THE DOWEL DIAMETER AND ARE TO BE BLOWN CLEAN WITH COMPRESSED AIR IMMEDIATELY PRIOR TO PLACING GROUT. THE HYDRAULIC CEMENT GROUT SHALL BE ONE OF THOSE APPROVED IN MATERIALS I.M. 491.13 AND SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

Indicate dowel setting procedure on the plans.

E1026/M1026: Dowels, cost

THE PRICE BID FOR "STRUCTURAL CONCRETE" SHALL INCLUDE THE COSTS OF SETTING BARS AS DOWELS IN THE _____.

E1030: Sheet pile, material and installation

THE SHEET PILE MATERIAL SHALL MEET THE REQUIREMENTS FOR ASTM A328/A328M OR A572/A572M GRADE 50 STEEL FOR STRENGTH AND WELDABILITY. OTHER SHEET PILE MAY BE USED IN PLACE OF THE ONE DETAILED, BUT THE MINIMUM SECTION MODULUS REQUIRED SHALL NOT BE LESS THAN _____ CU. IN. PER FOOT OF WALL. SHEET PILES SHALL BE DRIVEN TO FULL PENETRATION.

Use this note when sheet pile is a bid item. Note that the ASTM A328/A328M specification has a minimum yield point of 39 ksi, which will control the sheet pile design.

M1030: Sheet pile, material and installation

THE SHEET PILE MATERIAL SHALL MEET THE REQUIREMENTS FOR ASTM A328/A328M OR A572/A572M GRADE 345 STEEL FOR STRENGTH AND WELDABILITY. OTHER SHEET PILE MAY BE USED IN PLACE OF THE ONE DETAILED, BUT THE MINIMUM SECTION MODULUS REQUIRED SHALL NOT BE LESS THAN _____ CUBIC MILLIMETERS PER MILLIMETER OF WALL. SHEET PILES SHALL BE DRIVEN TO FULL PENETRATION.

Use this note when sheet pile is a bid item. Note that the ASTM A328/A328M specification has a minimum yield point of 270 MPa, which will control the sheet pile design.

E1040A/M1040A: Deck placement sequence, steel girder, unbalanced two span

NOTE: ROADWAY SLAB SHALL BE PLACED IN SECTIONS FOR FULL WIDTH OF ROADWAY IN THE FOLLOWING SEQUENCES:

A. SECTION 1 AND SECTION 2 SHALL BE PLACED IN THE SAME DAY. HOWEVER SECTION 1 MUST BE PLACED FIRST AND REMAIN PLASTIC UNTIL SECTION 2 IS COMPLETELY PLACED.

B. SECTIONS 3, 4 AND 5 MAY NOT BE PLACED UNTIL THE SECOND DAY FOLLOWING THE PLACEMENT OF SECTIONS 1 AND 2.

C. NO ALTERNATE PROCEDURES FOR PLACING CONCRETE IN THE ROADWAY SLAB WILL BE ALLOWED.

If directed by the supervising Section Leader, use this note on a two-span steel bridge where one span is significantly longer than the other span. In that case, place the shorter span first to reduce uplift. Place this note under the concrete placement diagram in lieu of the note shown on the current standard.

E1040B/M1040B: Deck placement sequence, steel girder, two span

NOTE: ROADWAY SLAB SHALL BE PLACED IN SECTIONS FOR FULL WIDTH OF ROADWAY IN THE FOLLOWING SEQUENCES:

A. SECTION 1 AND SECTION 2 SHALL BE PLACED IN THE SAME DAY. HOWEVER THE SECTION PLACED FIRST MUST REMAIN PLASTIC UNTIL THE OTHER SECTION IS COMPLETELY PLACED.

B. SECTIONS 3, 4 AND 5 MAY NOT BE PLACED UNTIL THE SECOND DAY FOLLOWING THE PLACEMENT OF SECTIONS 1 AND 2.

C. NO ALTERNATE PROCEDURES FOR PLACING CONCRETE IN THE ROADWAY SLAB WILL BE ALLOWED.

If directed by the supervising Section Leader, use this note on two-span steel bridges. Place positive moment sections first and then the negative moment sections over the piers and abutments. Place this note under the concrete placement diagram in lieu of the note shown on the current standard.

E1050: Deck drains, material and cost

NOTE: DRAINS ARE TO BE GALVANIZED. x DRAINS REQUIRED. SEE "SITUATION PLAN" FOR LOCATION. WEIGHT = x LBS. PER DRAIN IS BASED ON ROLLED TUBE. COST OF DRAINS TO BE INCLUDED IN PRICE BID FOR "STRUCTURAL CONCRETE".

This note is to be placed near the drain detail, not in the general notes. Include cost of drains in structural concrete unless the project has a structural steel bid item. If the cost of drains is included with structural steel, delete the sentence "COST OF DRAINS IS TO BE INCLUDED IN THE PRICE BID FOR ".

Current continuous concrete slab bridge standards indicate drain weight is based on welded plate and not rolled tube. This may be modified at some future date. Continue to use the slab bridge standards without change.

M1050: Deck drains, material and cost

NOTE: DRAINS ARE TO BE GALVANIZED. x DRAINS REQUIRED. SEE "SITUATION PLAN" FOR LOCATION. MASS = x kg PER DRAIN IS BASED ON ROLLED TUBE. COST OF DRAINS TO BE INCLUDED IN PRICE BID FOR "STRUCTURAL CONCRETE".

This note is to be placed near the drain detail, not in the general notes. Include cost of drains in structural concrete unless the project has a structural steel bid item. If the cost of drains is included with structural steel, delete the sentence "COST OF DRAINS IS TO BE INCLUDED IN THE PRICE BID FOR ".

Current continuous concrete slab bridge standards indicate drain weight is based on welded plate and not rolled tube. This may be modified at some future date. Continue to use the slab bridge standards without change.

E1060/M1060: Paving block, installation and removal

BEFORE THE CONCRETE PAVING BLOCK IS PLACED, LINE THE NOTCH WITH TARPAPER TO PREVENT BOND. BLOCK IS TO BE REMOVED BEFORE PAVEMENT IS PLACED.

The paving block may not be required if traffic does not impact the bridge end before pavement is placed.

The office recommends placing this note with the paving block detail and deleting it from the abutment notes. Length of paving block sections should be 6 to 8 feet (1.800 to 2.400 m). Paving block length should be rounded down to the nearest six inch (150 mm) interval.

E1070: Reinforcing, pier spiral

NOTE: SPIRAL REINFORCING IS TO BE NO.4 BAR WITH X" DIAMETER 12" PITCH WITH 4 EQUALLY SPACED L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 1/2 EXTRA TURNS AT TOP AND BOTTOM OF COLUMNS.

M1070: Reinforcing, pier spiral

NOTE: SPIRAL REINFORCING IS TO BE NO.10 BAR WITH X mm DIAMETER 300 mm PITCH WITH 4 EQUALLY SPACED L22 x 22 x 3.2 SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 1/2 EXTRA TURNS AT TOP AND BOTTOM OF COLUMNS.

E1080/M1080: Temporary barrier rail, layout

THE PLANS SHOW A LAYOUT FOR TBR FOR BOTH STAGE 1 AND STAGE 2 CONSTRUCTION. THE TEMPORARY BARRIER RAIL SECTIONS ADJACENT TO THE WORK AREA FOR STAGE 1 TRAFFIC ARE TO REMAIN IN PLACE UNTIL TRAFFIC IS SHIFTED TO THE STAGE 2 TRAFFIC LANE. THE TEMPORARY BARRIER RAIL SECTIONS ADJACENT TO THE WORK AREA FOR STAGE 2 TRAFFIC ARE TO BE IN PLACE PRIOR TO SHIFTING TRAFFIC TO THE STAGE 2 TRAFFIC LANE.

Place this note on one of the temporary barrier rail (TBR) plan sheets when TBR is placed adjacent to a large drop-off that may occur in stage construction projects.

The total TBR furnished equals the TBR necessary to protect Stage 1 traffic plus the TBR necessary to protect Stage 2 traffic. All sections are to be tied down, and a suitable detail should be shown.

This note is not required for deck repair projects.

E1090/M1090: Beam stirrups, adjustment

NOTE: FOR MODIFIED STIRRUP EXTENSIONS, SEE "BENT BAR DETAILS" AND BEAM DETAIL SHEET FOR DIMENSIONS AND LOCATIONS.

Add this note on beam detail note sheet when increasing the stirrup heights due to haunches more than 2" (50 mm).

E1091/M1091: Beam stirrups, extension

NOTE STIRRUP EXTENSION

Add this note on beam elevation detail sheet when haunches are more than 2" (50 mm). This note is to be used in conjunction with note E1090.

11.11 Estimate reference

Reserved

11.11.1 Index

Reserved

11.11.2 Listing

Reserved